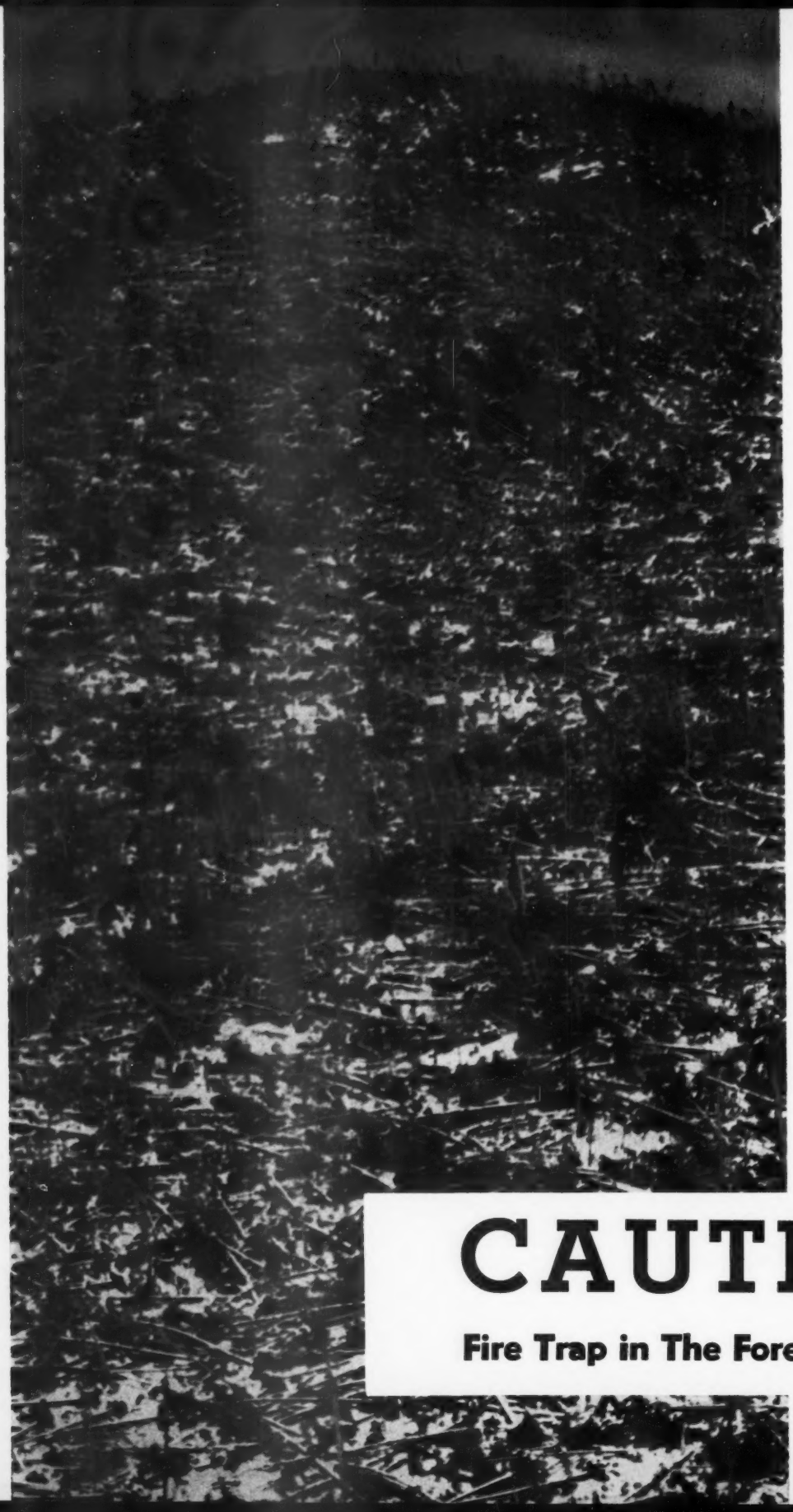
THE NEW YORK STATE

Conservationist

June-July 1951

BERGEN SWAMP

STATE OF NEW YORK, CONSERVATION DEPARTMENT


CAUTION
Fire Trap in The Forest Preserve

NOW, IN THE FOREST PRESERVE

In one respect at least, we're all conservatives; we don't want the good things changed.

Take the Forest Preserve, for example. The very name is both majestic and romantic, and as such it stands for the way we feel about this property and also for what we expect to get out of it. The name suggests a wilderness of tall healthy trees, a shelter for birds and animals and plants, a sort of natural haven where Nature can work out her own designs without interference from man. In establishing the Forest Preserve we retained for ourselves only the rights of visitors, and denied ourselves the right to make any changes. We didn't quite trust ourselves; the Forest Preserve, we felt, was something so good that the influence of man could only spoil it; let well enough alone; let only nature work on it.

Nature did work on it, and now we have to. The storm last November transformed a lot of what was once majestic and romantic into an incredible mess. A lot of trees went down, and with them a lot of dreams. But we feel that a good deal can be salvaged from both the trees and the dreams, and both at once.

By far the greater part of the Forest Preserve escaped the storm, and so will look to summer visitors pretty much as it always has. Nevertheless, the storm hit enough places—and hit them hard enough—so that you may sense a general change throughout the Adirondacks, something new in the atmosphere. Symbolic of this change will be the whine of a chain saw, the clip of an axe, the drone of heavy machinery, the straining grind of trucks in low gear hauling out logs and pulpwood. Where once there was the peace-and-quiet that was so great a part of our dream of the Forest Preserve, now you may find it hard to escape the sounds of men at work.

We respectfully suggest that you shouldn't even try; these are the honest sounds of a lot of people pitching in on an enormous clean-up job. Practically nobody is cutting standing timber in the Adirondacks these days, although that would be much easier and probably much more profitable; almost everybody concerned is cleaning up the mess.

You can sense a nice community of spirit and purpose in this. Everybody seems to be pulling together. The actual accomplishments, too, are satisfying; it's good to see a tangled mass of uprooted spruce converted into a neat pile of pulpwood.

Furthermore, the operations themselves are interesting. You may regret the necessity for them, but they certainly are new and interesting. What comes next will be interesting too—new plants coming up in the stirred earth, new birds and animals moving in.

We suppose that for many people this point of view won't be an acceptable substitute for the way they've always felt about the Forest Preserve, but at the moment we don't see any other alternative. Whatever your point of view, however, we would like to remind you that it could go up in smoke; the woods are ready for burning.

If you should happen to come across anybody who doesn't know this, please pass the word along.—Editor

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NO STAMPS, PLEASE

THE NEW YORK STATE
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Bergen Swamp

by Prof. W. C. Muenscher
President, Bergen Swamp Preservation Society

A typical ecological group in the swamp, including pitcher plant, spotted turtle, twin-flower, goldenrod (solidago Ohioensis), arrow grass, sphagnum moss, prostrate juniper, Eastern arborvitae. By Erik Hans Krause

HAS it ever occurred to you how fortunate it is that all-wise Nature did not amass, in one locality, all the attributes that make an area desirable for human occupation? Instead, the desirable attributes are distributed in various combinations, permitting man some choice in the way he uses his surroundings.

As everybody knows, our surroundings in New York include a variety of natural features—hills and mountains, rivers and lakes, marshes and swamps. Least appreciated, and least considered by man in his selective use of his surroundings, are the swamps. Many of them have been drained to accommodate necessary expansions of population centers or to provide agricultural areas for the production of truck crops. Others have been flooded by impounding water for hydroelectric power, navigation and recreational uses. And whenever it seems necessary to establish speedier lanes of transportation or travel, the swamps are frequently expected to make way.

As a result of all this activity, typical swamps have become rare in western New York. As we pointed out above, their disappearance has been a matter of little concern to the general public. But those of us who are interested in the flora and fauna of our State are well aware that a protected swamp affords environment for plants and animals that can thrive in no other type of location. If only for this reason, some of our better swamps and bogs deserve protection and preservation.

One of these is Bergen Swamp in Genesee County. It is a unique area centered on a large marl bog and supporting habitats for a larger number of kinds of plants than occur in any other area of similar size in New York State. (Marl is defined as a deposit consisting mainly of clay mixed with lime.—Ed.)

Back in 1936, a small group of pioneers who recognized an obligation of the present generation to save Bergen Swamp for future generations, organized the Bergen Swamp Preservation Society.* With dues from its membership, numbering about 100 individuals, and a few small gifts, this Society was soon able to purchase a few choice tracts of the swampland. That was the beginning. Then, in 1947, the Society received the annual award of the Founder's Fund of the Garden Clubs of America, and three years later was selected as a project for support by the State Federation. With this help, additional tracts were bought, until the Society now owns about 500 acres.

Bergen Swamp is located in the townships of Bergen and Byron, about 20 miles from the City of Rochester and about three miles west of the Village of Bergen. This places it within a few hours ride by car or rail from the principal centers of population, industry and education in western New York. Such a strategic position makes the swamp easily accessible to naturalists and others interested in the study of its flora and fauna.

The particular feature for which Bergen Swamp is best known consists of an open marl bog area surrounded by a forested swampy border in which arbor-vitae (white cedars) predominates. While the marl bog is an extensive and interesting feature of Bergen Swamp, it represents not a static but a dynamic area, the uniqueness and persistence of which is highly dependent upon the physiographic features surrounding the marl areas and the types of vegetation that they support.

Bergen Swamp is situated about 600 feet above sea-level. It is about three miles long and one to one and a half miles wide, and occupies an east-west depression on a plain overlying the Salina formation of the Silurian. A few miles to the south is the Onondaga limestone escarpment. The depression itself is rather irregular because of the uneven deposition of large amounts of glacial till. None of the underlying strata is here exposed because of the depth of the till. A continuous supply of lime-bearing water from the springs flowing northward into the depression is favorable for the formation of marl deposits.

Forming a wide curve near the northwest corner of the swamp, and turning from west to east, flows Black Creek. While it drains Bergen Swamp it is also in part responsible for maintaining it. It has its main source some 20 miles southwest in the hills of the Portage escarpment in Wyoming County. Draining a rather large area, chiefly agricultural land, it picks up a considerable load of silt. From its general northward flow this current is diverted to the east when it strikes the depression,

* Anyone interested in the kinds of plants that have been found in Bergen Swamp is referred to *The Vegetation of Bergen Swamp*—Parts I to VII in Volume 9, Proceedings, Rochester Academy of Science, 1946-1950. The groups of plants covered in sequence are the vascular plants, epiphytes, myxomycetes, algae, diatoms, fungi, liverworts and mosses.

Anyone interested in the conservation of Bergen Swamp may write to Dr. Babette I. Brown, Corresponding Secretary of the Society, Prince Street Campus, University of Rochester, Rochester 7, New York, requesting the leaflet entitled "Bergen Swamp —Some Questions and Answers."

where much of the silt load is dropped along the banks. The frequent deposition of this silt is responsible for striking differences in the physical and chemical natures of the soils of the north and south sides of the swamp. Whereas, near Black Creek the area of raised alluvial soil is subject to periodic flushing or drenching with large volumes of silty surface water, the southern part of the swamp receives smaller but more continuous flows of underground clear water from numerous springs.

An examination of the soils around the margin of Bergen Swamp shows that neither the glacial till nor the soils formed subsequently are uniform. These differences in the soils are also reflected in the composition of the vegetation occupying these areas at the present time.

Pink lady's slipper and salamander

Bergen Swamp is readily accessible from Torpy Hill on the east or from the south. Through old abandoned woods trails the forest rim of birch, maple, ash and hemlock is crossed to the edge of the arbor-vitae belt. And then, what do you find?

On the moist moss-covered turf in the shade of arbor-vitae, large masses of blue and white violets abound, the dwarf dewberry and starflower are everywhere, and the miterwort thrives along moist stream borders. In open glades, where the sun penetrates, several shrubs including swamp honeysuckle, bayberry and swamp buckthorn form a border around little copses, protecting clusters of yellow lady's slippers. A little later the showy lady's slipper raises its beautiful blossoms in boggy glades protected by shade part of each day. A wild valerian closely resembling garden heliotrope forms a showy border with grass-of-Parnassus along the edges of pools in partial shade.

In the shrubby border of the marl and on higher, better drained marl, mats of creeping juniper form a background in May for the small white lady's slipper, which is represented here better than anywhere else in New York State. On still higher areas, in late summer, the tall flat-topped Ohio goldenrod is abundant and Houghton's goldenrod, smallest of them all, is found in the best stand known in New York State. Dwarfed tamaracks, 100 years old but only a few feet high, present a pleasing landscape with clumps of low-growing autumn willow and shrubby cinquefoil.

Scattered among the wet open marl areas in which sedges and rushes predominate occur many hummocks, often only a few yards in diameter — areas raised about a foot or two above the surrounding marl—covered with a dense mat of sphagnum mosses. These moss beds are the foundation for beautiful arrangements and designs of color, form and texture. Several shrubby creepers contributing to these little natural plantings include the small cranberry, twin-flower, the creeping snowberry, bunchberry and wintergreen. There are also the higher bushes—Labrador tea, huckleberry and several blueberries.

Among the evergreen creepers, the shy little sundew thrives in abundance and the pitcher plant adds color with its reddish and persistent spreading leaves. Scattered individuals of orchids are found in season. Also showy white clusters of cotton grass and the flowers of the false asphodel, followed by their reddish capsules, and the dwarf species of false Solomon's seal.

Toward the east end are some wooded knolls on which white pine and hemlock are the dominant trees, interspersed with hardwoods. Here the hobble-bush and azalea appear to be making a last stand among other shrubs, such as mountain maple and fly honeysuckle. Of the herbaceous species, the painted trillium occurs amongst a profuse growth of Indian cucumber-root, clintonia, goldthread and others. In one rather moist area of about one acre thrive scattered clumps of the one-flowered pyrola. Nearby the forest floor is carpeted with the pink of fringed polygala, with occasional white-flowered forms.

Obviously, we cannot list here all the forms of plant life found. We mention only a few.

For over a hundred years botanists have been visiting the area and finding there many kinds of rare, unusual and beautiful plants. Ornithologists and bird-lovers, studying the abundant and varied bird life of the swamp, have ascertained that a number of warblers, not usually found nesting in the countries bordering Ontario Lake, do nest in the swamp. Among them are the black-throated green, the black and white, the magnolia and, in all likelihood, the Canada, hooded, and mourning warblers as well as the red-start and ovenbird. Every spring whip-poor-wills are seen in the swamp, while barred owls, great horned and screech owls are at home there. During the summer months for some years now turkey vultures have taken up headquarters in the swamp and on any visit they can be seen in their remarkable gliding flight over the area. To the zoologist, three reptiles, rare for this part of the country, live and breed in the swamp. They are Muhlenberg's turtle, the coal skink, and the massasauga or prairie rattlesnake.

NO article as short as this one can do much more than suggest the richness — the extraordinary richness — of Bergen Swamp. Although the swamp is now mainly the province of the relatively few people who know it and care for it, the significance of its existence is being understood and appreciated by more and more of our citizens, including many who have never seen it and perhaps never will. They understand that as a wild island in a rising sea of civilization, it must be preserved. It is a part of the culture of that civilization.

PROGRESS REPORT: POLLUTION

By ANSELMO F. DAPPERT, P.E.

Executive Secretary, Water Pollution Control Board

PREVIOUS articles in THE CONSERVATIONIST have discussed both the pollution situation in this State and the measures which have been taken to combat it. Specifically, in the issues of February-March, 1949, Assemblyman Harold Ostertag, Chairman of the Joint Legislative Committee on Interstate Co-operation, outlined the immense scope of the pollution problem and the proposed legislation which his committee felt would be necessary to cope with it. As reported in the following issue of the magazine, legislation based on the Committee's recommendations was enacted without a single dissenting vote, and the new pollution control law came into being.

This law has now been in effect roughly two years, and it appears advisable to review some of the accomplishments that have been made under it. Before doing this, however, it will be pertinent to set forth the basic features of the law itself:

1. A Water Pollution Control Board, having broad and far reaching powers, duties and responsibilities over pollution is established, comprising the heads of five departments of the State government. (Health, Conservation, Public Works, Agriculture and Markets, Commerce.)

2. A public policy is established which requires, in effect, the treatment of all untreated sewage and wastes to the extent that reasonable methods for so doing are known and available and consistent with the interests of health, conservation and the industrial development of the State. The maintenance of reasonable water quality standards is made a primary mechanism for the establishment of this objective.

3. The purpose of this law is (a) to prevent new pollution and (b) to abate existing pollution in accordance with certain basic principles and procedures specified in the law.

4. For prevention of new pollution, a mechanism is established whereby approval of plans and permits for construction, operation and discharge of effluents from all new outlets is required.

5. For abatement of existing pollution, a rather progressive series of steps —admittedly time consuming, but none-the-less positive and progressive— is required. All specific waters must be surveyed and studied, must be classified according to the principle of best usage in the interests of the public, and must be assigned quality standards appropriate to each such classification established. Once the classes and standards are established for any specific waters, discharges which contravene the standards are violations—and the Board is in a legal position to issue orders if necessary to require abatement of pollution.

The law, however, makes provision for extensions of time in which to comply with orders on two grounds: (1) if the violator is financially unable to comply, or (2) if there is no known available and reasonable method of treatment. In regard to extensions, the burden of proof will be on the violator, who must convince the Board that he has faithfully tried to comply with the Board's order.

WITH respect to prevention of new pollution, the law requires approval of plans and permits for installations involving new outlets or for improvements involving old outlets. Last year approximately 700 such plans were processed. These plans include municipal and industrial wastes treatment works, installations to serve schools, camps, summer hotels and similar establishments, and private residences which are located on public water supply watersheds protected by rules and regulations promulgated by the State Commissioner of Health. This work is accomplished by a central office staff of five engineers supplemented by the assistance they receive from a staff of 15 district sanitary engineers and 11 county sanitary engineers.

With respect to the program for abatement of existing pollution, considerable progress is being made notwithstanding the very limited staff and facilities which are available to the Board.

In October 1950, after a year's work and development, the Board adopted "Rules and Classifications and Standards of Quality and Purity for Waters of New York State." These constitute the system by means of which all waters throughout the State ultimately will be classified and assigned quality standards. Seven classes with appropriate standards are established for fresh surface waters, four classes are established for tidal salt waters and two for ground waters. These classes are established on the basis of best usage determinations expressed in terms of that single usage which requires the highest or most rigid quality standards. The standards for the first four fresh water classes are appropriate to the purpose of encouraging the propagation and growth of fish life. The standards for Class D are sufficient to prevent injury to fish life. The standards for the two lowest classes do not consider fish interests. The consummation of this very involved and somewhat controversial task of developing such a system and establishing appropriate quality standards has been a highly gratifying accomplishment.

With respect to the survey-classification program, there are in this State about 70,000 miles of streams and 3,500,000 acres of inland water areas. To accomplish the survey and classification of all of these waters with the present limited staff and facilities will take about 15 years. Obviously, there should not be a delay of 15 years until the

Modernization of a 37 year old sewage plant at Schenectady (above and below). Circular sludge digestion tanks under construction.

Piling under sludge disposal, and (below) old Imhoff tanks being rebuilt as mechanically cleaned settling tanks

clasification program is complete before enforcement measures are undertaken. There are many miles of relatively unpolluted waters throughout the State, the survey of which will have to be delayed. Meanwhile, reliance can be placed upon the mechanisms applicable to new sources of pollution to maintain the present qualities of these waters. Therefore, efforts are being concentrated on those drainage basins and streams, both large and small, where real pollution problems exist.

For this survey work, there is a staff of only four engineers, a mobile laboratory, and staff of four chemists, and a biologist assigned from the Conservation Department. Considerable assistance of course is being given by the staff of district and county sanitary engineers and by the Shellfish Sanitation Unit of the Conservation Department.

Classification work requires a survey of each particular water, the preparation and publication of a report including the recommended or suggested classifications, a public hearing on the proposed classifications, a final determination by the Board and filing of the assigned classes and standards with the Secretary of State for publication.

The acomplishments in this respect to date are as follows:

1. All surface waters in the Rondout-Wallkill River basin except for the area above Merriman dam involving about 900 square miles have been surveyed. A report has been published and public hearings have been held. Work is now proceeding on final draft of the classes and standards for presentation to the Board for official adoption.

2. Moriches Bay basin (Suffolk County) has been surveyed (70 square miles) survey work was completed in and the public hearings on these waters was held May 10.

3. Chautauqua Lake—Conewango—French and Brokenstraw creeks basin (about 1,000 square miles) has been surveyed. Report has been prepared and is in the hands of the printer. Public hearing will be held in late summer or fall.

4. Onondaga Lake basin (400 square miles) has been surveyed. Report is now being prepared. Public hearing likely to be held this fall.

5. Saquoit Creek basin (70 square miles) survey work was completed in April and a report prepared.

6. Mill Creek basin (30 square miles) survey work completed and report being prepared.

7. Big Sister Creek basin (50 square miles) survey completed, report prepared and now being printed.

8. Olean Creek basin (180 square miles) survey work completed, and report being prepared.

9. Esopus Creek basin in Ulster County (150 square miles) survey work about completed.

10. Sawmill River basin (45 square miles) now being surveyed.

11. Sparkhill Creek basin (30 square miles) survey work about completed.

12. Delaware River basin (2,500 square miles) preliminary survey work in progress since first of the year.

13. Mohawk River basin survey work started April 1, 1951.

Thus, considerable progress in the survey classification work has been accomplished. Considerable progress has also been achieved in obtaining many needed improvements—all on the basis of co-operative endeavors and with no classification work or enforcement procedures involved whatsoever.

Noteworthy success has been achieved during the past year in advancing the cause of pollution abatement in various ways and all as a result of voluntary co-operation on the part of municipalities, industries and persons who have recognized the needs and proceeded with works either to prevent pollution or correct specific pollutional situations. In up-state New York during 1950, there were approximately 50 municipal construction projects involving construction of new (or additions and modifications to existing) sewage treatment works involving expenditures of somewhat more than $20,000,000. Sewage disposal works were constructed last year throughout up-state New York to serve more than 150 schools, camps, summer hotels and similar establishments. There is a record of some 13 industries which have provided new or additional waste treatment works during the past year. One of these projects, not quite completed, will cost $265,000.

THUS the co-operative approach—in terms of accomplishments toward the objectives of the Board—has been demonstrated to be a good one. It will always continue to be used as the first approach in the pollution abatement programs. But it cannot be allowed to be an excuse for unreasonable delays in situations where it is reasonable to expect progress. So far as possible, the Board will continue to seek full co-operation on the part of municipalities, industries and all persons throughout the State in the attainment of the objectives set forth in this new pollution control law. But as a last resort—and where needed improvement cannot be brought along in any other way—when the circumstances are reasonable the Board may have to invoke the Act's rather stringent enforcement provisions.

SUPPLEMENTAL FEEDING OF WILD TROUT

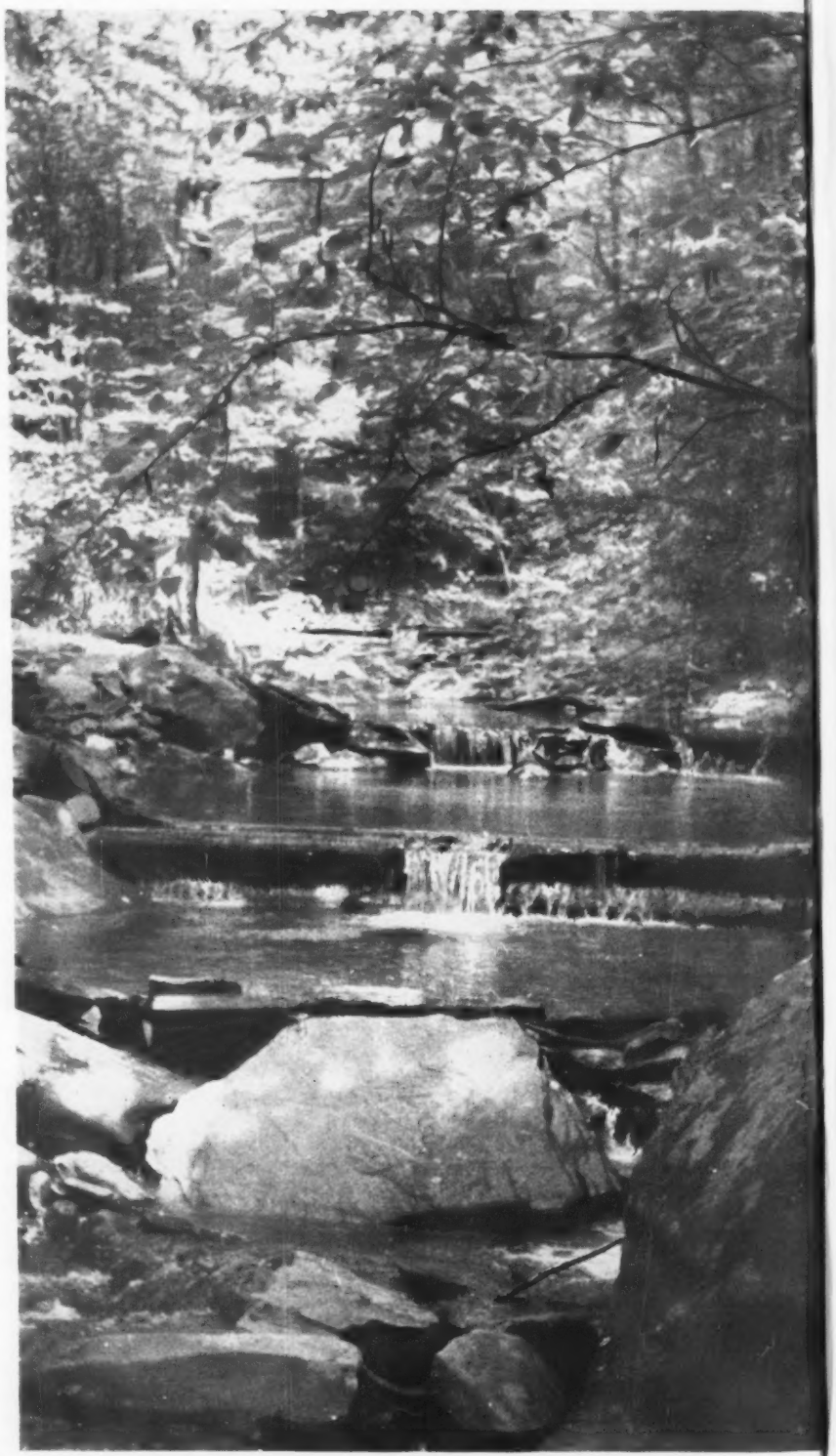
AS cautiously as any fly fisherman approaching a choice casting spot, the man with the pail of fish food made his stalk to a location on the stream bank. Below him and slightly upstream was a quiet place where the bottom of the brook was visible. Rapid water on all sides of this obscured the bottom. No trout were to be seen, anywhere. As accurately as a well cast fly, a ball of fish food was thrown into the middle of the quiet water. Barely seconds later a moving trout cast his shadow across the pool bottom. Another and yet another followed. The splashes of more lumps of food thrown into the quiet water were echoed by the splashes of hungry trout.

If you have ever seen farmyard chickens rally to the dinner gong beaten on a tin pail full of scratch feed, you will know how fast the trout gathered. What mysterious grapevine of communication was set off by the first splash of fish food? Perhaps as one trout moved to the spot his neighbor caught the significance of this motion, for the shadows of moving trout were visible far downstream from the feeding place. One of the late arrivals was a large brown trout of about 18 inches. Many of the early comers, including brooks and browns as large as ten inches, had to take the leavings after the big fellow had sailed into several balls of food pitched right over the plate.

This happened—and continues to happen—in a certain stretch of water controlled by a small fishing club whose members say they have finally learned that of all the many management practices they've attempted, including stocking and stream improvement, they consider stream feeding the most worthwhile. They are not alone in this belief, for wild trout are fed in many spots in many different states and in foreign countries.

The fact is that food supply and trout supply are intimately, though somewhat complexly related. Every angler has experienced days when fish refuse to bite because they are too full of food to be interested in taking another mouthful. But it is no less true that every angler has tried his luck, without success, in waters where insufficient food for trout has caused the fish to depart for better pickings.

Such contrasting conditions can and do exist in the same places—in the



Good shelter for trout, but what about food?

same stretches of water—during the course of a single season. The rate of digestion being variable in all fish, food is utilized slowly in cold weather. After a spring rain which washes in much food, trout may eat all they can handle at the prevailing water temperature. But perhaps the very same stream in mid-summer may have a low carrying capacity for these trout, which will require more food than they did in the ice-cold water of early spring. If the food is not available they may move off; if they stay, they will not achieve their maximum potential growth.

A chain is as strong as its weakest link. If a shortage of food for a brief period is the weak link in the chain that provides good trout fishing, can't something be done to strengthen that link?

Up to now the supplemental feeding of wild trout, although long advocated by some of the foremost authorities on trout management, has not been given much thought by the average angler. As we pointed out before, however, it has been done here and there by many persons and in many places. Experimentation and development has been most extensive on private waters, and for obvious reasons intensive management of this kind on public waters cannot be expected to spring up over night. Yet there is something to be said for local enterprise; if more sportsmen devoted time and effort to the feeding of trout in local waters during critical periods, it appears that they would be making a substantial contribution toward more and bigger trout, and better fishing.

But perhaps the most realistic way to view stream feeding, at present, is to regard it as an extension of the sport of fishing, as a sport or hobby that individuals or groups may find entertaining as well as rewarding. Trout respond so readily to regular feeding—say twice a week or even every day if practicable—that it is a pleasure to see them turn out for the event. Wild fish that have never seen a hatchery soon learn to take regular feeding as well as planted fish. Nevertheless, they still retain their wariness. One may not like to see fishermen casting their lures over the feeding spots, but there is good reason to believe that well fed trout are no easier to take than their unfed brethren.

Those who have tried winter feeding of game birds and found that crows, squirrels and jays got more than their share of the food may expect that stream feeding will be wasteful. Remember, however, that trout can be fed in full view of the observer, and fed quickly. Competitors have little chance to hog the food under these conditions, and furthermore, whatever food escapes the fish will increase the fertility of the water. And predators are not likely to benefit, for the concentrations of trout are only temporary; when not being fed the trout will stay out of sight if the section of stream selected has good pools and cover.

IF you decide to try feeding wild trout you will be pretty much on your own from start to finish, from supplying the food to delivering it to the fish. In view of the limited research that has been done in this field of management, only rather general advice can be given here.

First, will feeding improve your fishing? In theory, at least, feeding will raise the maintenance capacity of any stream; it will, in other words, enable the stream to support more pounds of trout than would be possible on natural food alone. Those streams that obviously support more trout than they can supply with adequate food will benefit most. Typically these are the streams which have abundant but stunted fish.

The time of year to begin feeding, and the time to discontinue it, should be governed largely by water temperature and stream flow. Following the cold weather and high water of early spring there will come a time, perhaps in May or early June, when trout will begin to get hungry and perhaps restless. Then is the time to attract and hold their attention with food. Patience may be required until the trout learn the game—after all, this is something new to them—and once the feeding spots have been selected they should be worked often enough to keep the fish interested. Daily feeding is good but not necessary; several feedings a week should be enough once the fish have caught on. As to quantity, feed what the traffic will bear. By watching the fish, one can usually tell when they have had enough.

Although many advances in fish culture have been made through scientific research in the field of nutrition, experts on trout diet cannot prescribe very exactly for wild trout. The reason for this is that hatchery diets are made up on the supposition that trout receive only the rations distributed to them, while wild fish constantly pick up quantities of insects and other natural food items. Fortunately, this simplifies the problem; supplementary foods can be far less rigid in requirement. Anything the trout will eat, preferably high in protein, is likely to be suitable. Even dry bread makes a workable food for supplementary feeding.

Foods for trout either float or sink. Most of them sink, and these are usually taken as they go toward the bottom or are cleaned up after they have reached the bottom. Bread, ground lungs and some dried types are floaters, and cause trout to splash more actively. Carried by the current, such foods also distribute better.

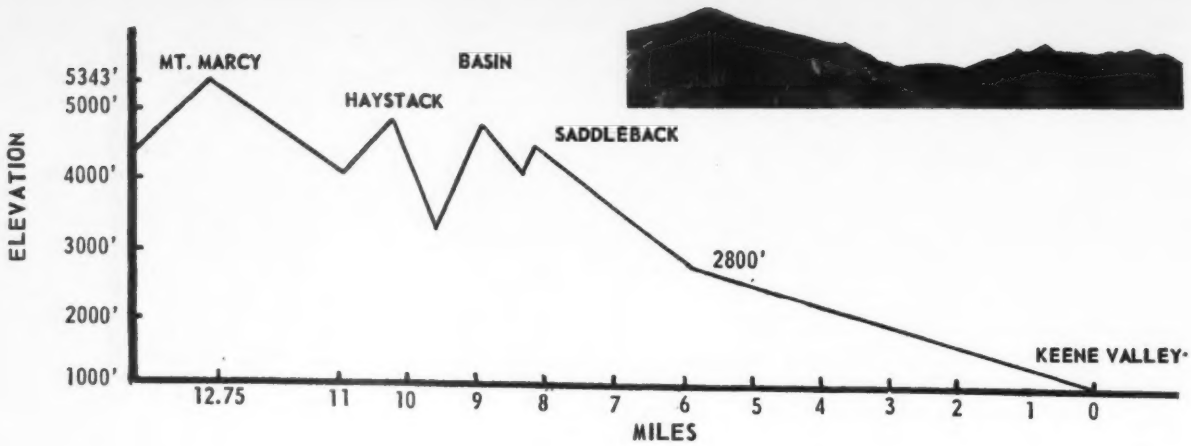
Dried food mixtures that can be made up as needed through addition of water are generally very handy. A good mixture, developed by the Salmo Fontinalis Club, is made up of about one-third pailful of beef meal, same amount of skim milk flakes, four ounces of bone meal, six ounces salmon egg meal and one cup cod liver oil. Dry ingredients are mixed first. Enough water is added to make the mixture work up into a ball that will break apart when it strikes the water.

Fish food companies, farm feed stores, cereal companies, meat packing companies all provide sources of food materials for such fish food mixtures. The field is wide open for new and better combinations. Refrigeration is sometimes a problem if fresh meat or fish products are handled in quantity, but prepared foods—such as various types of pellets or canned dog foods—have been fed with success, and present only minor storage problems. Live foods, such as fresh water shrimp, are also used but in our opinion such feeding is in most cases impractical on natural streams. This, however, is another subject, and cannot be discussed fairly in this article.

THE purposes and aims of stream feeding may be very different in various areas. In heavily fished waters generally the holding of some larger trout is to be desired. Such fish help keep down chubs or other competitors. In addition they produce large crops of eggs, which may be needed if natural reproduction is light because of scarcity of breeders. In lightly fished waters where good fly fishing is the aim, stream feeding may need to be planned so as to avoid heavy bottom feeding. Trout that gorge heavily on non-floating foods are reported to become less fly-minded than those fed upon a floating fare.

Catching trout is only one of the rewards for the effort of feeding them. Over the winter, trout that have been fed will scatter and contribute to the catch over a large area next spring. But even when the man with the food pail has no thought of his fishing tackle, he will admire the sight of the many fine trout who know him only for his worthy deeds—"casting bread upon the waters."

—JOHN R. GREELEY,
Chief Aquatic Biologist



THE RANGE TRAIL

OF all the trails maintained by the Conservation Department, the Range Trail* along the sky line of the high peaks of Essex County is the most respected by the State Rangers whose job it is to keep it open. No wonder.

Starting at the Adirondack Mt. Club's lodge five miles up the north side of John's Brook from Keene Valley, at an elevation of nearly 2,300 feet, this trail climbs 2,230 feet in three miles to the summit of Saddleback (El. 4,530). It then loses several hundred feet and climbs to the 4,825-foot peak of Basin; loses elevation again and then ascends to the 4,918-foot peak of Haystack, and finally ends at the 5,343-foot summit of the Cloud Splitter, Mt. Marcy. The difference in elevation between the start of this trail and the finish is 4,250 feet, but the hiker must climb about 5,100 feet (because of lost elevation between peaks) in a total distance of 6.45 miles from John's Brook Lodge. The trip is described in Recreation Circular 8, *Trails to Marcy*, which is available on request to the Department.

The round trip in a day from Keene Valley is not advisable. Five miles up the trail is the John's Brook Lodge of the Adirondack Mt. Club, with bed and board for hikers at low cost. In the vicinity are six State lean-tos where one may camp at no cost. With one of these shelters as a base it is possible for a well conditioned hiker to do the Range Trail without a pack in a day.

Doing the Range Trail is an adventure. To enjoy it completely, rise early —say 3 a.m. Eat a lumberjack breakfast and take the blue trail at John's Brook Lodge. This should enable you to reach the lean-to between Gothic and Saddleback by 6 o'clock. Take a ten minute rest and follow a red trail easterly up the steep ridge of Gothic to the summit to see the sun rise. If you get a break from the weather, this is something you won't forget. When the sun gets above the horizon the mists begin to rise and the hiker suddenly finds himself in the midst of a swirling fairyland with vistas opening and closing, now far and now near. At times he will be sitting on a rock which seems to be floating on a cloud, with other rocks and the tops of neighboring peaks sticking up through the low-lying overcast and bathed in a glow of sunlight.

By 8 a.m. the sun will be settling down to its job. So the hiker (like the mountains) comes out of his daze, descends to the lean-to and stretches out for a short rest with the black wall of Gothic looming up before his eyes and seeming almost endless, in spite of the fact that he just came down it in about 20 minutes flat.

It's time to get going up the easy ridge of Saddleback. (Don't fail to look back frequently.) You quickly come to the west peak of Saddleback with its fine lookout. Then what? Then sometimes it's necessary to hunt for the trail unless you've been tipped off that it goes straight down over the cliff. Be careful to avoid being tipped off literally. It's a quarter mile down—almost straight down—to the start of the climb up Basin, another almost perpendicular, but with a rope and a ladder to assist on some ledges. It's safe enough, however, and the climb is negotiated by many women every summer. Wide views all the way up, and all creation on top.

This is the half-way point. Some people wish it were the end; they get discouraged when they look across the deep gulf of the AuSable to the frowning ridge of Haystack. But it's not as bad as it looks, and anyway we can tip you off that it's really easier to go on than to turn back.

Basin is steep both ways and is negotiated at some slight risk to britches and skin. Then a short rocky climb brings the hiker to Snow Bird lean-to, where another rest period is indicated. (Before reaching this haven, a shortcut trail to Slant Rock and the trail back, takes off.) Plan to reach Snow Bird by 1 o'clock.

BETTER get going—up the Haystack ridge, and at the top turn south up the half-mile of bare ledges to Haystack summit, by most authorities considered as affording the grandest view in our mountains. Haystack is in every respect a mountain—above timberline and seemingly much higher than its official 4,918 feet until one looks across the 1,700-foot deep gulf of Panther Gorge to the higher cone of Marcy. Were you going to climb it? Better not. If the time is 3 p.m. it will be wise to be satisfied with the view of Marcy and make tracks for lower altitudes. To do that, return to the blue trail and continue northerly down a rocky, gullied trail to a junction. Here follow a red marked trail northerly to Slant Rock—down hill all the way. You may get back to the base before dark. But you'll have to hop.

—A. T. SHOREY

* This trail has been closed since the storm of November 25. Department men are now working on it and it is expected that it will be passable by July 1. But it is suggested that prospective hikers contact Local Department field men before starting out.

HOW TO DO IT (14):

WITH MAP AND COMPASS

SKILL in woods travel can be compared to skill in almost any sport or profession; it is acquired by practice. Experienced woodsmen, those who earn their living in the woods, rarely have any difficulty in woods travel. This article is not written for them.

But these days more and more people are going into the woods for a holiday of some sort or other and getting into difficulties, to the embarrassment both of themselves and the Forest Ranger force which is generally called upon to go in and find them. This needn't happen if: (1) You carry a pocket compass and learn how to use it. (2) Obtain a map of the area you want to visit and study it before starting. (There are no unmapped areas in New York State.) (3) Consider personal equipment and clothing carefully. Proper footgear, dry matches, a bottle of fly dope may make or break the trip. (4) Don't get panicky if you do become confused or lose your bearings. This is the most important fundamental of all.

A pocket compass is indispensable for either a novice or a professional. Some who consider themselves experts belittle the necessity of carrying a compass and give out with the idea that if you're any good you don't need one. I disagree.

Compasses, no matter how plain or fancy, all have one fundamental purpose, which is to indicate magnetic North. For the occasional woods traveler any good two dollar compass is all that is necessary. If it is just a needle, then the thing to know and remember is which end points to the north. This is always indicated in some manner. Remember also that accurate readings cannot be made close to iron and steel (your gun, for example).

With regard to maps, the best for woods travel are those published by the United States Geological Survey (see page 24, April-May '51 CONSERVATIONIST). They are made to cover an area of about seventeen miles north and south and twelve miles east and west. They show all physical features such as roads, lakes, rivers, as well as contour lines indicating elevations. These maps are sold by the U. S. G. S., Washington, D. C.

Assume now that you have equipped yourself with a compass and map. If you co-ordinate them you can go wherever you wish, and you can get back. I suggest that as part of the preparation for a trip and in anticipation of it, you carefully examine the map. First, note the scale, then the North point. At the bottom of the map is printed "Scale = 1/62500", sometimes written "R. F. 1/62500". The R. F. means representative fraction, which further simply means that one inch on the map represents 62,500 inches—or very nearly one mile—on the ground. The maps are all printed so that the top of the map is true North.

In planning a trip, draw a line and scale the distance from your starting point to your objective. Check its direction by orienting the map with the compass. This is done by placing the compass on the map and moving the map under it so that North on the map coincides with North on the compass. Scale the line, but remember that the distance scaled is level measurement—it will be less than the distance you actually walk because you walk slope distance.

After studying the map, can you hold a compass in your hand and visualize the direction or angle you should walk with respect to its north end? Can you visualize how it should look when you want to turn and come back to your starting point? If you can, you are all set to start out and return.

But suppose you *do* get lost or lose your bearings. Positively the worst thing to do is to get panicky. As soon as you realize you are turned around, sit down and think it over calmly. Remember you have walked only two miles an hour (unless you've been on a trail) and that should help you figure out how far you may have traveled. Just running anywhere can do no good and may get you into real difficulty—by causing you to fall and get hurt, or just by exhausting your strength. Why be afraid? No animal will attack you, and a person can go without food for days if he has to.

At this point it is easy to see that if you carried a compass and knew the direction in which you had started out, you could retrace your course. It is also apparent that even though equipped with a compass and map they would be of little help unless you knew two things: namely, your approximate starting point on the map and the direction you traveled from it.

IF you don't know any of those things, then just sit down, make yourself comfortable, and holler. Soon the Forest Rangers will come and get you. But please sit down and stay put.

Some people say that the thing to do when lost is to follow the streams down. If you do that you will, of course, eventually come out somewhere. But you may take a long, long walk.

—AL DAVIS, *Forest Surveyor*

4-H Conservation

By Wilson F. Clark
Extension Conservationist, Cornell

RIK Hensen, Nancy Sherman, Dick Denton, Joyce Dunning ..... Just names? No, not just names. They're boys and girls who are among the many 4-H Club members who have been practicing conservation. They've been planting trees, raising pheasant chicks, planting wildlife food and cover shrubs, managing woodlots, and carrying out soil conservation practices—just to mention a few of their conservation projects. They've been doing a—

"Hold on, there. Before you get going, what's this 4-H business? Never heard of it myself."

You never heard of 4-H Club work? Well, there are about two million girls and boys all over the United States who are in it right now, and 52,000 of them are New Yorkers. The 4-H organization is a unit of the Extension Division of the United States Department of Agriculture. Within New York State, the administration of the organization is centered in the office of the State 4-H Club Leader, Albert Hoefer, at the New York State College of Agriculture at Cornell University. Also at the College are located the specialists in the various fields of 4-H project work. In the counties, the programs are directed by the County 4-H Club Agents—54 strong. The Agent's job is to help the 4,700 local club leaders (all of whom are volunteers) in their guidance of the girls and boys in their clubs.

Membership in the 4-H Club is open to every girl and boy between the ages of ten and twenty-one, although you can often find a younger brother or sister tagging along with a club. Most 4-H Club members are rural youngsters, but urban children may also join or form 4-H Clubs. It doesn't cost a cent to join, although individual clubs may levy small dues if they wish.

The activities of a local 4-H Club would be difficult to define, for they vary greatly. The value of the work is that a club's program it fitted to its community's situation and needs. The fundamental purposes of the club are to help young people learn grass-roots democracy in the running of the club, to help them grow in their ability and desire to take responsibility and participate in community and world affairs, and to teach them specific skills (through the project programs) which will make them better citizens and give them a fuller and happier life.

"Just a minute. You haven't mentioned what the four H's stand for?"

Well, they're the key to the whole program. They stand for Head, Heart, Hands, and Health. In the 4-H Club pledge they're used this way:

I pledge my Head to clearer thinking, my Heart to greater loyalty, my Hands to larger service, and my Health to better living, for my club, my community, and my country.

The 4-H Club motto, too, helps to define the purposes of the organization: "*Make the best better.*"

"O. K. for the background. Now what about these conservation projects?"

4-H work in forestry has been going strong ever since 1925, when the tree-planting project was first introduced. In this project, Club members apply for 1,000 coniferous tree seedlings, to be used as demonstration plantings in the reforesting of non-agricultural land on their farms. The trees are obtained from the nurseries of the New York State Conservation Department through Professor Fred E. Winch, Jr., Extension Forester at the College of Agriculture at Cornell. The trees must be planted properly and must be protected from grazing if the member's one-acre plantation is to meet the project requirements. This spring 739,000 trees were planted by 4-H Club members, and since the start of the program 23,473,800 trees have been planted under this first-year forestry project.

The second forestry project is called "Know Your Trees." It involves identifying, making collections of, and mounting leaves, twigs, and fruits of at least 15 common New York trees. Some Club members don't stop there; they have made collections of as many as 75 different New York trees for this project. Learning how to identify the trees is necessary for a member who wishes to take the more advanced forestry projects, for without a knowledge

of the tree species a young forester cannot sensibly manage his woodlot or plantation.

Woodlot management is the third in the series of 4-H forestry projects. It emphasizes that trees in the woodlot are a crop of the land, just as much as are corn or potatoes. As a crop, they must be handled wisely and harvested in such a manner that a new crop of trees will always be coming along. Foresters call this type of management "sustained yield management." It involves the 4-H Club member's using his knowledge of tree identification, his knowledge of what tree species are suitable for different markets and forest products, as well as his training in how to improve the quality and rate of growth of the trees in the woodlot. Just to give you an idea of the details that a member must tend to in completing a project, here are the stated requirements of this one:

(1.) Lay out a quarter-acre plot in the woodlot. (2.) Band with paint the crop trees to be left in the plot. (3.) Mark all trees to be cut. (Weed trees, and trees of poor quality.) (4.) Make a record, by number and species, of all trees on the plot. (5.) Fell all trees marked for cutting. (6.) Trim, stack, and measure the felled material. (7.) Protect the plot or whole woodlot from grazing (to insure good tree reproduction). (8.) Keep a careful record of the work to show the time and costs of carrying out each of the operations. (9.) Submit the records to the County 4-H Club Agent.

Soil conservation

The last and most advanced forestry project is called "Log Scaling and Timber Estimating." It is designed to teach the youngsters, through practical experience, how to find the board-foot contents of logs and standing timber, and how to lay out fairly accurately a one-acre plot in the woods so that a tree inventory can be made on which management plans are then based.

4-H projects in wildlife conservation have not been available to club members for as long as have the forestry projects, but even so, youngsters are showing tremendous interest in them. The Pheasant Rearing Project, which has been going full steam for several years, has served well the sportsmen of the State. In 1950, for example, 1,494 4-H Club members were allotted 49,000 pheasant chicks. Fifty-one counties participated and the State average for rearing was 70.6 per cent, with the top county rearing 87.7 per cent of their birds. This project has been co-operatively directed by the 4-H Club organization and the New York State Conservation Department, through Earl Holm, Superintendent of Game Farms.

In order to help answer the need for "More Cover on the Land," and to improve and increase wildlife habitat areas in the State, a new project was started in the spring of 1950. It's called the 4-H Shrub Border Planting Project. In the spring of 1951, 20,000 shrubs were planted by 80 members, and we had many more applications from girls and boys than we could fill.

Forestry

Pheasant rearing

Tree planting

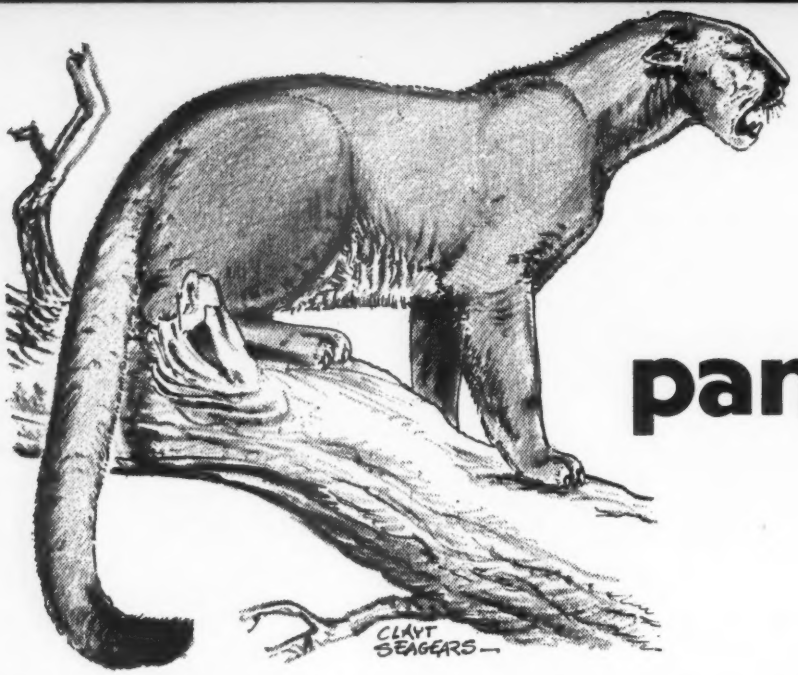
For several years a state-wide Fox Trapping and Pelt Preparation Project attracted considerable interest. It was sponsored by the Joint Wildlife Control Committee of the Farm Bureau Federation, the New York State Conservation Council, and the *American Agriculturist*, in order to help hold in check the serious outbreak of rabies. In 1948 a total of 801 young trappers caught 1,691 foxes, while in 1949 (the last year of the state-wide project) 1,108 trappers caught 1,511 foxes, with the top trapper catching 42.

Other wildlife projects are now in the process of development. One of these (which we hope will be ready this fall) is a Fur Management Project. Others will deal with stream improvement, farm fish pond management, and control of small animal pests.

In the soil conservation line, a 4-H Club member may first meet the idea of contour planting in his regular garden projects. Although the garden project is not a soil conservation project as such, yet it requires the 4-H Club members to plan and plant the garden according to sound principles of soil and water management. For larger soil conservation operations, there are two 4-H Club projects. The first of these requires that the youngster lay out and establish a strip-cropped field. The second involves erosion control on upland slopes through proper seeding and management, for the purpose of establishing permanent meadows.

That just about covers the picture on 4-H conservation projects on a state-wide basis. Several of the County 4-H Club Agents have developed excellent conservation programs of their own, such as Conservation Field Days, Conservation Tours, and various activities that individual 4-H Club members or clubs can undertake. In addition, there's the annual Adirondack Forestry Tour each fall. There's the annual Western New York Forestry Field Day, sponsored by the *Buffalo Evening News*. There are the conservation programs in the county 4-H summer camps. And there's the 4-H Conservation Training Camp held each year at Cornell's Arnot Forest, under the direction of the State 4-H Club Office and the Cornell Department of Conservation. This last-mentioned camp each year gives 50 older 4-H boys a week of intensive field training in practical forestry, soil conservation, and wildlife conservation.

Well, that's the story in brief on conservation work in the 4-H Club program. What do you think of it? Want to start a 4-H Club?



panther

DO you wish a farm pond for your hippopotamus? Or a hippopotamus for your farm pond? If it's the pond you need, we've told you many times in these pages how to install one. But if you're going to install a hippopotamus, then you should get in touch with Meems Brothers & Ward, a very enterprising concern down in Sparkill, New York. We don't have their latest catalog but last year they were quoting a nice spring bargain on hippopotamus at $4,000, which price included "suitable shipping crates and sufficient fodder." We have no reliable information as to whether the hippopotamus is subject to inflation or not; since last spring they may have gone up, or they may have gone down to the bottom. But we feel sure that the hippopotamus supply-and-demand situation remains approximately the same, and you can get some if you wish.

That goes for black panthers too. The price on these is (or was last spring) a cool thousand. Very reasonable, we think, because if you really want a black panther somebody has to catch it in the only place it grows wild —which is in the tropical parts of the Eastern Hemisphere—and then bring it over here.

Also in the catalog, listed between South American ocelots and African servals, is the cougar, price $200. They come cheap because they don't have to be imported; they've been at home on the North and South American continents, from Canada to Patagonia, from sea level to elevations of 13,000 feet or more, for centuries. This is *Felis concolor*, otherwise known as the cougar, puma, mountain lion, catamount, panther, painter. (*Puma* is preferred, but we'll call him *Panther*). He has probably the widest distribution of any American mammal, and also the widest renown in legend.

From the Straits of Magellan to British Columbia, from Florida to New Brunswick, this species is essentially the same. A mature male is about eight feet long (a good two feet of which is tail), weighs about 150 pounds, stands about two and a half feet high at the shoulder, has very powerful shoulders, relatively short legs, and feet that leave a four-toed track about four and a half inches across. The claws are about an inch long, but as with other cats they are retractile and so usually don't show in the track.

As to color, Theodore Roosevelt remarked that the variation among individuals was very similar to that of whitetailed deer—somewhere between the "red" summer coat and the "blue" of winter, although the panther's color does not change with the seasons. Anyway, the animal is usually described as yellow-brown, tawny. Audubon observed tartly that "it is but little more like the true panther than an opossum is like the kangaroo," but he could hardly deny the resemblance between the panther and the female lion.

That resemblance was responsible for the first of a long series of misunderstandings about the American panther. The first settlers in New York thought the animal really was a lion. Vanderdonck's History states that "although the New Netherlands lie in a fierce climate, and the country in winters seems rather cold, nevertheless lions are found there, but not by the Christians." They were found by the Indians, who brought the skins into the settlements. The thing that troubled the New Netherlanders was that none of the skins had the manes that they associated with male lions; they therefore concluded they were all females, and went on to do some nice biological invention to account for this.

Regardless of what they were called, however, there is no doubt but that in the early days panthers ranged widely over most, if not all of the present State. But as civilization advanced the panthers retreated before it (as they have elsewhere in this Hemisphere) until, by about 1850, the Adirondack wilderness remained their last stronghold. It was not until 1871, however, that any official records concerning panthers became available. That was the year the State put a bounty on them.

The bounty was $20. Between 1871 and 1894, when the last bounty claim was paid, a total of 99 panthers came in for redemption, all from the Adirondacks. It is known, however, that more were killed which for some reason were not presented for the bounty (including the largest of which there is anything like an authentic record in the State—a 200-pounder killed by Verplanck Colvin on Seventh Lake Mountain, Hamilton County, in 1887).

The reason for the bounty was the panther's well founded reputation as a deer killer. Authorities estimate that a mature panther, in regions like New York where venison is in good supply, eats a deer a week, and there is plenty of evidence that he kills a good deal more than he can eat. (There is a

record of a Colorado panther which killed 18 sheep one night, 27 the next). Assuming a peak population of 100 panthers in the Adirondacks, according to these figures they would take a toll of more than 5,000 deer a year. That's approximately the reported take by hunters last fall. Anyway it is certain that predation by panthers was a very significant factor in controlling Adirondack deer populations—and at a time when deer hunting was good, and the bucks big. With the panther gone (and also the wolf), some biologists feel that the coyote is moving in to fill the natural niches they vacated.

Evidently, the bounty had little if anything to do with the disappearance of New York panthers; they were on the way out long before the State put a price on their heads. Bounty or no bounty, throughout their range in this hemisphere and all the way down through their history they have been hunted with a determination unequalled in the pursuit of any other species. Something had to give, and it was the panther.

Dr. Merriam reports that in the Adirondacks, the usual procedure was to hunt them on snow. The hunter snowshoed through probable panther territory until he came across a track; he followed the track until he found a reasonably fresh deer kill; then, knowing the animal was somewhere in the vicinity, he turned loose his dog or dogs. (Almost any dog that could and would follow the scent was good enough; fox terriers are still considered good.) Pursued by a dog, the panther almost invariably jumped into a tree and stayed there until shot down.

It appears that this winter hunting, particularly when the panthers were concentrated around deer yards, was very effective. E. L. Sheppard, who killed or took part in killing 28 Adirondack panthers and so ranks as the State's top hunter of this species, was mainly a winter operator. So was J. C. Farmer, who in 1871 killed four in one month in the Township of Newcomb, Essex County. But George Muir killed 15 in three years (1879-81), all but four of them in the Township of Fine in St. Lawrence County, and none of them in the winter. So panther hunting was a year 'round possibility. Nevertheless, the lure of a deer yard must have greatly simplified the tracking down process; when food is scarce, or when the mating season is on, the panther often makes 25 or 30 miles of tracks a day. And if he gets in a jumping mood, there may be 40 feet between tracks.

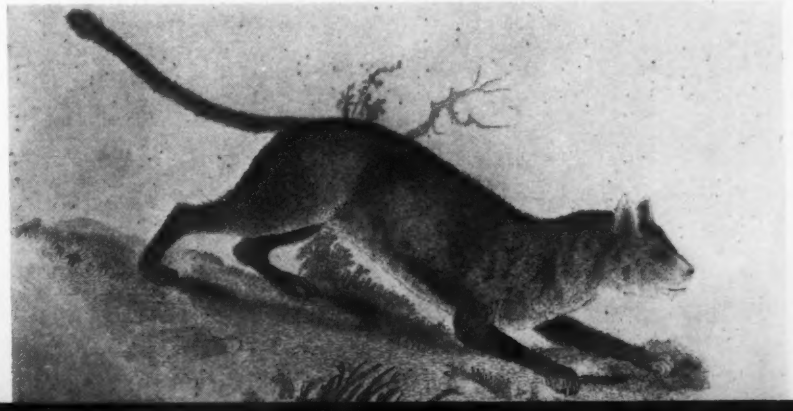
THE mating season, in December here, usually produced one to four spotted cubs 96 days afterwards, but it also produced something that has outlived all the panther progeny. That was the scream. Panthers make a variety of intensified cat noises at any time of the year, but in the mating season they are particularly vocal. One night at the Bronx Zoo, Dr. William Beebe watched a panther scream. "It gave utterance to a loud, long drawn out quavering cry which seemed as if it would never stop, and epitomized the essence of wild nature. To imagine it, multiply the most awesome yowl of a back fence tommy by several times its amount of ominous, menacing, portentous, terrifying, appalling character."

Lots of people imagined it. Out on the headwaters of the Missouri, a strange howl ringing through the hills brought out a posse of experienced panther hunters; they tracked down a steamboat. Up in Malone, old-timers who knew the cry of the panther grabbed their rifles and rushed out to meet—the first locomotive coming into town. And even today an owl in a melancholy mood is responsible for plenty of panthers, right in New York.

Are there panthers right here in New York? Since the last one was presented for bounty in 1894, there have been plenty of reports. Reliable authorities reported one near Tupper Lake in 1899, and one killed near Elk Lake in 1908. We have a letter (to be published in our next issue) from the present Principal of Camillus High School in which he recounts being trailed by a panther near Ticonderoga 40 years ago. And another letter from a man who says he has killed panthers out West and who reports he shot at one in Oswego County in 1949.

If we have panthers, where did they come from? According to our information (which we won't vouch for) they were last recorded in Pennsylvania in 1871; Massachusetts 1850, with a possible in 1926; Vermont 1881; New Jersey 1840; Quebec 1863; Ontario probably not later than 1848.

Early "panthers," from artists' conceptions of the past century



That takes care of our neighboring states and provinces. But it doesn't take care of the panther situation. Because, in one of the most spectacular, properly authenticated wildlife discoveries in recent years, a colony of six panthers was found this past winter in New Brunswick—where the species has been "extinct" for a lot longer than it has in New York.

It could happen here.

—P. W. FOSBURGH

ENEMIES

Flora

THE plant world has its subversive characters, no less than human society. When you look at a field of goldenrod, you wouldn't think anything was going on there that would make trouble for the red pine plantation in the next field. But the fact is that these attractive plants are working night and day to produce the spores of a disease which, when carried to the red pine, cause the needles to break out with a bright, orange-colored rash—a sort of "red pine chicken-pox." Many pine owners are greatly disturbed when they discover this condition and send letters or specimens to Albany. Actually this disease (which goes under the two names of "red pine needle-rust" and "goldenrod rust") rarely kills trees, though it does retard their growth considerably while they are young. Like the much more serious "blister-rust" of white pine, which divides its time between pine trees and plants of the currant-gooseberry genus, it needs more than one plant for its continued existence, and would die out from a given locality if either one of its "host" plants were eliminated. (That's why we can control blister-rust by pulling out currant and gooseberry bushes in the neighborhood of white pine woodlands or plantations.)

Another plant that may be cited for "Un-Pine-Like Activities" is the sweetfern. This isn't a real fern, of course, but just looks like one, and as a rust-carrier ranks right along with the currants, gooseberries and goldenrods. The spores from this plant make their second home on the pitch pine, but since the pitch pine isn't worth much, nobody cares.

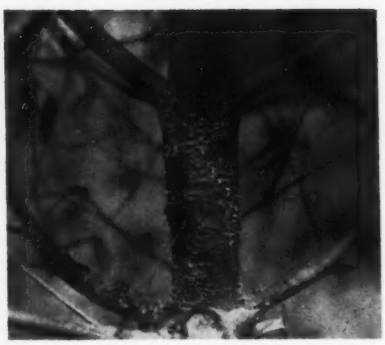
These three fungous diseases of pines are typical of a whole group of fungi which behave in a similar fashion (e. g. wheat-rust, cedar-apple rust, and others too numerous to mention). In every case, the two plants involved are far distant from one another in *botanical relationship*, but both grow in the same kind of *environment*. What no one seems to know is which came first—did it start, for instance, on gooseberry or on the white pine, the sweetfern or the pitch pine, the goldenrod or the red pine? This brings us to a new variation on an old question: Which came first, the chicken or the egg? Your guess is as good as ours.

Goldenrod carries a disease injurious to red pines

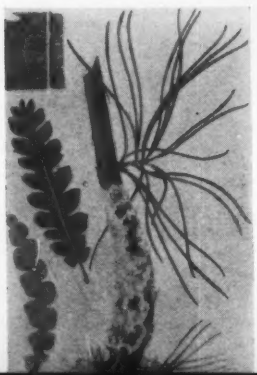
Needle-rust on red pine. Infection looks like this in June

Close-up of infected needle

Gooseberry plants are carriers of the white pine blister-rust



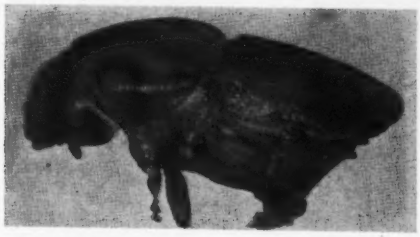
This is what the rust does to white pine



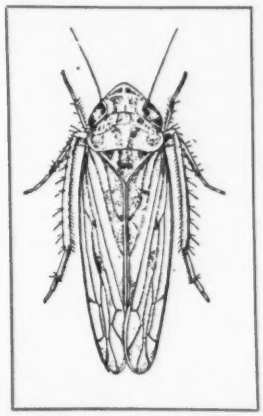
Sweetfern carries a rust, but only to pitch pine

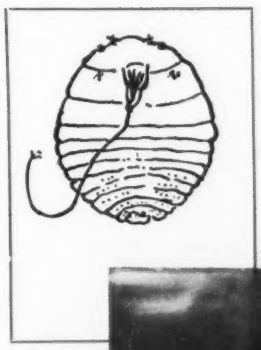
IN OUR MIDST

Fauna



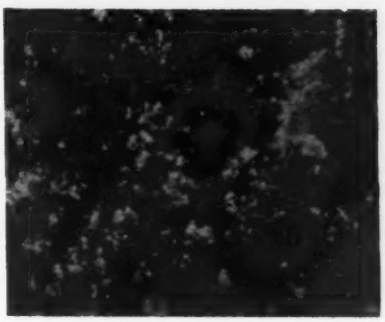
The guilty party in the spread of Dutch elm disease





Leafhoppers inoculate elms with a destructive virus

Above, the scale insect that works on beech, and some samples (including close-up at right) of what bark looks like when he's through



INSECTS that injure trees by direct attack are bad enough; but at least they fight in the open.

A more insidious type of bug is the one whose activities are harmless enough in themselves, but result in the tree becoming infected with some disease organism. The most notorious example is the Scolytid beetle which transmits the Dutch elm disease (see THE CONSERVATIONIST for October-November, 1949). In this case the beetle actually *inoculates* the elms by injecting the spores of the fungus into the water-conducting tissues of the new twigs.

In the Middle West, the elms have another disease even more fatal (with external symptoms almost identical with Dutch elm disease, but quite different in character and in methods of dissemination) known by the weird name "Phloem necrosis." Phloem necrosis is not a fungus but a virus. It is transmitted by an insect of the type known as "leafhopper." This bug feeds on the under side of elm leaves and if it happens during the feeding process to move from a diseased tree to a healthy one, the latter's days are numbered. So far, necrosis has appeared only as far east as Ohio, but New York may be next.

Another tree disease which needs an insect to soften up its victim is the tongue-twister called "Beech-scale Nectria." Heavy masses of scale insects covered with a white frothy substance may cause some injury to the bark, but the real damage is done when the tiny bug (about $\frac{1}{30}$ of an inch long) bores a microscopic hole into the bark tissues. The wound resulting from this action, though too small to see, is all the fungus needs to start an infection and eventually kill the tree. Beech-scale and the disease that goes with it, though native to Europe, apparently got its start here in the Maritime Provinces and Maine about 1920, and gradually spread westward through New England during the next 10 to 15 years, reaching New York State by 1936. So far, infestations are confined to parts of Ulster, Sullivan and Westchester counties. Big Indian, in Ulster County, is the site of the most extensive outbreak, and one of the few where the associated Nectria disease has been found to date.

—E. W. LITTLEFIELD,
Supt., Forest Management

Game Management Area:

Oak Orchard

AN enterprising furrier, Martin A. Schmitt of Buffalo, had a vision of owning a "farm" where he could raise crops of muskrats as another farmer might raise crops of potatoes or corn. Muskrat pelts to him were legal tender. He needed a marsh which would produce an abundant stand of cattails (the bread and butter of muskrats) and he knew that open land on which shallow water could be maintained would produce cattails. Schmitt purchased several tracts of the wettest land in Genesee County and established the M. A. Schmitt Fur Farm.

So began the recent history of the Oak Orchard Game Management Area. Others had tried to drain this area. Schmitt was the first to flood it.

He proceeded to erect a system of dykes designed to catch flood water and hold it through the summer. The work that he did was really remarkable for most of it was accomplished with hand labor and apparently without benefit of professional engineering service even for his levels, which, because of the small margin of error allowable, had to be quite precise. He enclosed his main marsh with a muskrat proof fence (he must have used at least a carload of it) buried six inches and turned inward at the top to prevent the animals from digging under or climbing over.

Early in his program, Schmitt encountered difficulty in maintaining water levels on his new marsh during dry periods. His first attempt to overcome this difficulty involved the erection of a windmill geared to a scoop device at the base which lifted water from a canal connected with Oak Orchard Creek, raised it about three feet and then spilled it into the swamp whenever the wind blew. But the wind didn't blow often or hard enough to deliver the necessary quantity of water, so he built a make-shift rotary pump belted to a gasoline motor. It proved to be very efficient, and is still in working condition after years of hard service. A commercial version now is on the market.

With the area in condition for operation, Schmitt secured a muskrat fur farming license from the Conservation Department. He then stocked the fenced marsh with high quality muskrat breeders secured from commercial sources, and sat back to await results.

Mr. Schmitt planned to let his breeding population build up to maximum production and then to harvest the surplus each year. But fate intervened. Martin A. Schmitt died just as his dreams were about to be realized, as so often seems to be the case with pioneers. Heirs of his estate had little interest in the project and within a short time the dykes had developed leaks, the fence was broken down, and poachers had stripped the area of the animals which Schmitt had so laboriously nurtured.

A marsh which is managed for muskrat production usually becomes excellent waterfowl habitat, and Schmitt's marsh was no exception. Therefore, when the property came up for sale interested parties included duck hunters, the Federal government (looking for a duck refuge), and the Conservation Department. As funds under the Pittman-Robertson Act became available to the Conservation Department, negotiations between the Department, representatives of the Schmitt estate, and private interests resulted in a compromise whereby title to the key Schmitt holdings was vested in the State at a nominal cost.

Incorporated in the Pittman-Robertson Project which was set up to acquire the Schmitt property were provisions to purchase parts of several adjoining farms to round out the area and to provide facilities for permanent development features. Acquisition work on some of these properties has been in progress now for over a decade. To put it mildly, there have been many associated trials and tribulations.

Meanwhile, another Pittman-Robertson project was initiated to establish a system of permanent dykes and water control features so that a maximum area of the property could be flooded. This work was delayed by the war but the first and most important segment of the project was finally completed during the summer of 1950. Over two miles of new or rebuilt dyke are now in operation, with water levels controlled by a system of five concrete spillways, three of them 50 feet wide.

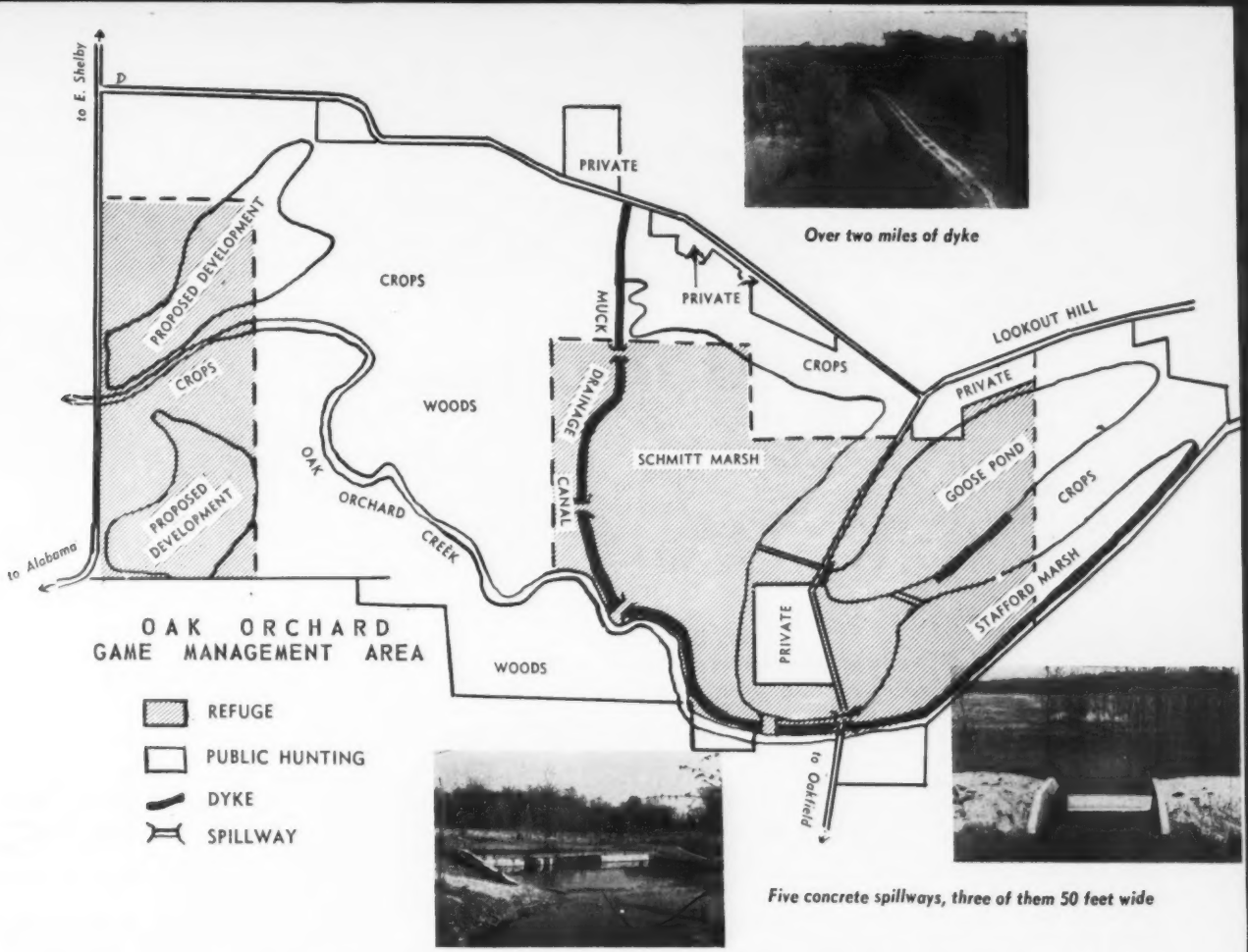
When anticipated development of two additional pools is completed, there will be nearly 1,000 acres under water at Oak Orchard.

Game Management Areas are usually established to serve a key purpose. In designing a management plan for an area, however, an effort is made to incorporate as many other uses as may be compatible with the key purpose, with the public interest, and with the capabilities of the area itself. This is what is meant by the term *multiple* use.

THE Oak Orchard Game Management Area was established as a place where migrations of Canada geese, and other waterfowl could rest and feed in security on their way north each spring. One has only to visit Oak Orchard in the spring to see that this primary purpose has been achieved. As a refuge, it also serves to encourage more of these birds to use this flyway in the fall, and being protected, they stay somewhat longer than they normally would in this part of the State. More waterfowl over a wider spread of the open season means better hunting for more hunters; and after all that's the ultimate objective. Already, better hunting is being experienced on nearby marshes open to the public, and parts of the Oak Orchard Area itself are kept open so that at least some of the increased numbers of waterfowl can be utilized by sportsmen. Furthermore, the refuge plan for the area is flexible and can be changed when necessary to permit maximum hunting opportunity in relation to game abundance. During this initial period about one third of the area, or roughly 800 acres, is included in refuge. The balance of about 1,500 acres, mostly wooded swamp and upland, is open and posted as public hunting ground.

In the management of duck marshes, muskrats are a useful tool for controlling cattail growth. Too much cattail growth is not considered conducive to maximum duck production. The 'rats on Oak Orchard will be allowed to build up to a level of population which will limit cattail growth at an optimum point. Surplus 'rats will be harvested on a controlled basis. The pelts will be sold and receipts credited against the cost of maintaining the project.

A game management area serves a very useful purpose as a proving ground for new practices and as an outdoor laboratory where research techniques can be tested. Oak Orchard has served re-



Over two miles of dyke

Five concrete spillways, three of them 50 feet wide

peatedly as a guinea pig to the ultimate advancement of overall knowledge in game management. One important experimental project involved the rehabilitation of upland portions of the area which used to be very productive of pheasants. The object of the experiment was to demonstrate modern land use practices which would yield good farm crops and provide good environment for pheasants. In co-operation with the Genesee County Soil Conservation District, about 300 acres of brushland have been cleared under this project and established on a crop rotation schedule, with balanced acreages each year of winter wheat, buckwheat, millet, corn and meadow grassland. Substantial amounts of grain are left standing and surpluses are harvested to be used in winter feeding on the game farms and elsewhere. This operation also serves a multiple purpose, for hoards of geese feed on the winter wheat and grain fields in the spring. The grain left standing furnishes fall and winter food and shelter for increasing numbers of pheasants and cottontail rabbits, and hundreds of deer congregating in the area each winter wax fat and healthy during their stay—and refrain from molesting grain crops and fruit trees of nearby farmers. Over 20 tons of wheat and several hundred bushels of corn are harvested each summer and stored for future use.

Under State administration, individuals and organizations interested in bird study have been encouraged to visit the area. Applicants are furnished permits to enter the several refuges subject to restrictions necessary to prevent undue disturbance of the birds, and guide service by the refuge manager (residing on the area) is furnished on request. (Multiple use again.) Increasing numbers of these binocular and camera "hunters" are annual visitors.

For several years the Buffalo Ornithological Society has conducted a spring bird census on the area in April, and the Genesee Ornithological Society of Rochester makes an annual pilgrimage to count the spring migration of waterfowl. As an example of the variety of bird life to be found on the area, one observer, Mr. Clark S. Beardslee of Kenmore, made a brief census on May 16, 1948. Between the hours of seven A.M. and one P.M. he counted 1,546 birds of 96 separate species.

Each summer dozens of American egrets spend a few weeks on the area fishing for frogs and fry. Last spring (1950) three white pelicans spent a fortnight cruising on Goose Pond. These are large snow white birds with a huge orange bill underslung by a tremendous pouch. The only other record of this bird in western New York during recent years is a lone specimen shot by an unknown party near Rochester about 1945. Rare nesting records for Oak Orchard include the shoveler duck, green winged teal and prothonotary warbler.

GAME refuge, public hunting ground, game research, hydraulic engineering, demonstrational farming, soil conservation, feed patches, surplus crops, winter feeding, twenty thousand Canada geese, 22 species of ducks, muskrat pelts, predator control and a thousand spectators on Lookout Hill overlooking Goose Pond on a sunny Sunday afternoon in April. Multiple use. Yes, Oak Orchard is quite a place.

—ROBERT PERRY,
District Game Manager

the mysterious eel

FEW, if any creatures of our present day have had as many weird origins attributed to them as has *Anguilla bostoniensis*, the common eel. It wasn't until 1864 that the larval stage, called leptocephalus, and the adult form we find in our fresh waters were recognized as the same fish. Until then, each was considered a different species.

As far back as the early Greeks, the reproduction of the common eel was a subject of speculation. The Greeks had learned the manner in which other fresh water fish spawned, but had slipped up on the eel. For this reason is was assumed that Jupiter, god of all children whose paternity was doubtful, was responsible for the presence of the mysterious eel.

Aristotle claimed that eels had no sex, eggs, or semen, and that they arose from the entrails of the sea, a term probably meaning they were spontaneously generated from ooze on the floor of the ocean. Aristotle's view was accepted for centuries by many. Meanwhile, others were producing more fantastic fables on the birth of the eel. Eels were said to generate from the slime and skin rubbed off on rocks from the parent. Some people thought they were viviparous, producing young similar to mammals. Others blamed the poor water beetle for their existence. And there are still people in this country who think the sea lamprey eel is the female common eel, although these fish are altogether different—not even remotely related.

It was not until 1777 that an Italian naturalist verified the fact that the female eel possessed ovaries. But, what about the male? It was not until 1873 that he came into his own and got the credit for siring little eels. However, the eel's spawning habits remained a mystery and it wasn't until fairly recently that a Danish investigator, Dr. Johannes Schmidt, found the approximate location of the eel's spawning ground, an area southwest of Bermuda in the Atlantic Ocean.

Upon maturing, the adult eel leaves its fresh water home and heads for its spawning grounds. From eight to 12 years are required for a female to reach this stage, but a male matures much younger. The eel, incidentally, is our only catadromous fish (one that leaves fresh water to spawn in the ocean; a reverse from the anadromous Pacific and Atlantic salmon that leave the sea to spawn in our rivers and streams).

The European eel is a different species from the American eel, but both spawn in the same area. Upon hatching, the larvae are flat, thin, ribbon like, transparent creatures. They soon head toward their respective home grounds. This trip takes about a year for the American eel, which approaches a length of six inches by the time it reaches the brackish waters along our Atlantic Coast. The European eel, however, takes three years to make its longer journey—which may be as much as 5,000 miles.

The larvae undergo metamorphosis after entering the brackish water and change from their flat colorless form into the shape we recognize in our fresh waters. At this time they have shrunk and are called elvers, for they look like miniature eels.

Now they are ready to grow, and they ascend our fresh waters in great numbers and reach all our accessible ponds, lakes and streams far inland. Many people have credited eels with the power of over-land travel on rainy nights. This idea has not been disproved and it is a fact that eels have been found on land. Possibly that accounts for their presence in some inaccessible bodies of water. On the other hand, eels may well have entered some such areas before the present barriers came into existence.

Eels have been known to live for many years under such landlocked conditions, but they will not reproduce in fresh water and must finally die off unless restocked. The eel, however, is a virtual ferret when it comes to finding a connecting water way and often takes advantage of temporary connections made during high water to travel just a bit farther.

OTHER fish, aquatic insects, crawfish and shrimp—eals eat them all. They are especially fond of horseshoe crabs and also of decaying meat or fish. Many anglers take advantage of the fact that they are scavengers and bait a favorite area to attract them before fishing.

Because eels inhabit all our waters

Our only catadromous fish—one that leaves fresh water to spawn in the ocean

accessible to the Atlantic Ocean, and since the population fluctuates because of the migrating adults and the appearance of elvers into our fresh waters each year, it would be impractical to estimate the size of the eel population, and impossible to figure just how much damage the eel is capable of doing to other species of fish. But it is known that they can be quite destructive under certain conditions.

SCHOOLS of eels will attack a gill net and leave only the heads of the gilled fish for the operator to dispose of. Eels are apparently fond of shad spawn and may prey heavily on the gravid females in spawning time. In some Canadian salmon rivers eels are regarded as very destructive to the young salmon, and they may be doing some damage in our own trout streams. Just how much they compete with our game fish in waters such as Lake Ontario and other favorite fishing grounds is hard to estimate, but we do know that they feed on the same food as our game species.

The spawning run occurs during the fall at which time they travel downstream in great numbers, usually at night during a time of high water. The female adult is larger than the male and may reach a length of five feet or more and weigh six or seven pounds. Once out to sea, the reproductive organs develop rapidly to a great size, nearly filling the entire body cavity. One estimation on the number of eggs produced by a three foot female was well over 10 million. This may be a high figure, but it is consistent with Nature's way of insuring some young reaching maturity in a species having a complicated and precarious life.

Eels are handled commercially in New York State. With certain restrictions they can be taken by spearing, angling, eel traps, eel pots, and weirs. In 1946, 94,846 pounds of eels were reported by commercial fishermen in this State as against 63,418 pounds in 1947. The difference was largely due to the fact that in 1947 the fishermen were unable to obtain horseshoe crabs to bait their eel pots in the Hudson River.

The eel is an excellent food fish both in taste and nutritive value. In Europe it is in such great demand that a thriving business is carried on by men who net the elvers as they enter the rivers. These are then shipped alive to men who raise them in landlocked lakes or ponds for market in a few years.

Eels can be served appetizingly in many ways. They can be skinned and fried as any other fish, or cut up for chowder. They lend themselves readily to smoking and smoked eel provides excellent fare. They may be baked and seasoned with your favorite sauce or they may be cut into fillets and sauteed.

If the eel hasn't been cleaned prior to purchasing, or if the fishermen has decided to bring one home to try, here is an easy way to remove the skin. Tie a stout string around the head, tie the string to a secure nail, cut the skin around the fish just below the head, peel back the skin a little and then quickly jerk the skin back the length of the fish. Remove the head, cut the fish open and clean it thoroughly, and remove the fins with a pair of scissors. If fillets are desired, just cut down through the flesh on both sides of the backbone.

Despite their familiarity with it, most fishermen view the eel with suspicion because of its snake-like body and the excessive amount of slime it is capable of producing. Once an eel is caught, the fisherman is usually in such haste to cut his line that he forgets it gave him a fight equal to almost any of our game fish.

Actually, fishing for eels can be a lot of fun and you don't need any expensive gear to enjoy it. And another nice thing about it: you won't have to worry about over fishing, because each year a new supply of elvers will ascend our rivers to replenish the stock.

BUT this article was not written to sell you a bill of goods on eel fishing, or eel eating. The idea is to acquaint you with some facts on the life history of one of our lesser known fish. If you realize how complicated is the pattern of an eel's life, if you stop to think of the battle he's had to get where he is, you can't help but show him the respect reserved for all fighting fish.

—WILLIAM A. PEARCE,
Aquatic Biologist

FISH PLANTING

George Philo, 44 years with fish and flowers at Oneida

The first State Hatchery at Cold Spring Harbor, 1887

Cold Spring now

The State "Hatching House" at Caledonia, (right) and the same today

ONCE upon a time the nations of the world took time off to go fishing with each other. Eighty years ago they began swapping live fish back and forth, hopeful that angling opportunities would be increased for local chapters of the international brotherhood of hook heavers.

It happens that New York State, home of America's two oldest fish hatcheries (Caledonia and Cold Spring Harbor), was a ringleader in this pleasant commerce. And it also happens that the sons of some of the men who had a part in the early struggle to renew the barren waters of the world are still at work in New York's hatcheries. In fact five members of two families—the Redbands and the Walters—have 169 years of service between them.

The Legislature created the first New York State Fish Commission in 1868, composed of Horatio Seymour of Utica, Robert B. Roosevelt of New York City and Seth Green of Mumford, Monroe County. Seth, later known as the Great-grandpappy of U. S. Fish Culture, already had succeeded in rearing lake trout (then known as salmon trout) at his own small private plant. He also had been fooling around with shad and had a burning ambition to do something for a lot of fishless water. There were no State hatcheries and few serious attempts at growing fish wholesale anywhere.

In 1869 the Legislature appropriated $10,000 to finance the Commission's propagation program. Seth Green retired as a Commissioner, immediately was hired as Superintendent of Fish Culture at $250 a month, and the hook-and-line boys, although they didn't know it then, got a new lease on life.

Seth's first directive in 1870 was to produce shad, whitefish and "salmon trout." He set up some temporary shad hatching boxes in the Hudson near Albany. Next, with part of the $10,000, he completed the "State Hatching House" on Spring Creek, Caledonia. On October 19, 1870, he stripped 80,000 lake trout eggs from 13 fish he netted (despite a gale that almost wrecked his boat) 17 miles off the Canadian shore of Lake Ontario. Two days later he put them in the newly-completed Caledonia troughs. A month later he went to Detroit, netted whitefish in the St. Clair River, and returned to Caledonia with several boxes of eggs. On December 12, the

PIONEERS

lake trout eggs started to hatch and on January 8, 1871, the whitefish spawn began to pop. The program to grow fish was under way.

The "State Hatching House" took less than two months to build. It wasn't any great shakes as a structure. But it sported 12 pairs of troughs and in 1871 it was proclaimed "the world's largest and most productive fish plant." It certainly made history.

The first notable international deal occurred in 1869 when Seth Green shipped a small can of brook trout eggs to England.

In the early spring of 1871, the fry of those first Caledonia lake trout and whitefish eggs were distributed in the Finger Lakes and a dozen other New York waters. But 4,000 were swapped with Canada for 4,000 Atlantic salmon eggs. In June, Green toted four 8-gallon milk cans of shad fry clear to California's Sacremento River in the first attempt to get the fish established in the Pacific. Four years later, the stocking was termed successful.

In 1873, Caledonia was really shelling out lake trout and complimentary shipments of fry went to 16 states and to Quebec. That same year, California began to reciprocate, sending 300,000 quinnat salmon spawn to Caledonia. The resultant fry were distributed through New York. Some went to Ohio.

That same year, grayling, previously believed to occur only in Europe, were "discovered in Michigan." Green lost no time. In April, 1874, he took his gear to Michigan's AuSable River, dug 106 impregnated eggs from a gravel bed, netted 80 mature grayling and dashed back to Caledonia with his loot. All 106 eggs hatched. The Fish Commission immediately reported them to be "the first and only grayling fry ever to be obtained artificially."

Modern Eastern fishermen got their first major shot in the arm from the deals of 1875 whereby California shipped in a batch of "mountain trout" (rainbow) eggs. Of the resultant fry at Caledonia, 260 lived to become the breeders which supplied not only New York but much of the East. The strain was mingled three years later with 113 so-called McCloud River rainbows which two Caledonia hatcherymen brought back alive from California.

The first State-hatched brook trout fry were distributed in 1876. That same

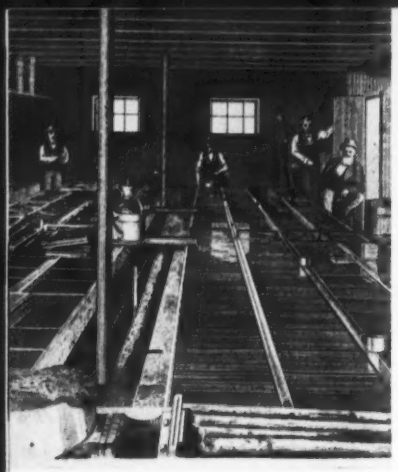
When delivering fish, it has always been a problem to keep enough oxygen in the water. Now it's done with tanks.

The late Frank Redland, (left) 51 years

Stanley Walters, 39 years

L. D. Winslow, 28 years

Art Redland, Sr. pours musky eggs for the 37th year



The old days at Cold Spring Harbor. Seth Green with the spade beard

Delivery of the hatchery output, 1887

Night scapping for walleyes, Constantia 1912. Note kerosene spotlight

year, the Fish Commission began to net smallmouth bass from Lake Ontario and distribute them down-State. In 1878, Caledonia sent by messenger 113 mature smallmouths to California. The 99 which arrived alive went in Lake Temescal near Oakland.

The year 1882 was a big one. It was then that Caledonia found it had more rainbow trout eggs on hand than it could hatch—probably because the Governor dealt the program a haymaker by vetoing its annual appropriation. So Seth Green blanketed the nation with an offer of up to 500 eggs to "any responsible party for a small packing fee." The response was terrific and rainbow trout eggs were shipped to every single state in the Union, including California where the parent stock came from in the first place.

Obviously, the fish business was busting at the seams. The appropriation hurdles were overcome and the Commissioners looked around for another plant, finally settling on Long Island's Cold Spring Harbor where a machine shop used by the whaling industry was turned into the first hatchery building. It stood up on the hill now traversed by Route 25A—which today brings up to 2,000 visitors to the hatchery per week-end.

It was to that Long Island hatchery that the first shipment of brown trout eggs to America was sent by Count F. von Behr, president of the German Fisheries Union. The shipment was addressed to Fred Mather, Cold Spring's superintendent who had met von Behr previously in Europe. Included were 80,000 eggs (then called saibling) of which, "60,000 were of the kind that grow large and 20,000 from the smaller trout of the upper tributaries of the Rhine."

Mather sent 12,000 of the best eggs to Caledonia, 5,000 more to the U. S. holding station at Northville, Michigan, and kept the rest. It wasn't long before those original German browns were augmented by several shipments of eggs from so-called Loch Levens—the brown trout of the British Isles. Those browns, like the rainbows, made history.

The Cold Spring Harbor Hatchery soon became a virtual international clearing house for fish. Incoming cans brought eggs of saibling from Bavaria, Alpine lake trout from Switzerland's Lake Geneva, golden tench from England, black-spotted (cut-throat) trout from the West, salmon from Maine and black bass fry from the Adirondacks.

In those days, and for years thereafter, fish never were grown beyond the fry stage. Most of the hatcheries (Bath, Constantia, Adirondack at Saranac Inn —and others were added before 1900) closed for the winter and started from scratch again in the spring.

The only transportation, of course, was by boat, buggy or baggage car. The Long Island Railroad didn't even run baggage cars but it permitted up to twenty fish cans and an ice can to ride for free (chaperoned by the hatchery messenger) in the aisles of the smoker, much to the inconvenience of the commuters. What with the lurching of the cars, those harassed individuals often didn't know whether they were smoking a cigar or a herring.

The N. Y. Ontario & Western Railway, among others, also issued passes for the fish cans and their chaperones and even provided free wagons to meet and transport shipments to streams along the railroad's right-of-way.

There were no expense accounts then and hatchery messengers, paid $1.50 per day, developed special techniques to keep them two jumps ahead of starvation and a skip in front of the law. Trips were long, often beginning at midnight, and the job of keeping a score of fish cans aerated with a tin dipper and cooled with ice wherever it could be gained (for free) was a backbreaker. Today a fleet of nearly 50 trucks carry automatically oxygenated tanks holding up to 1,600 pounds of fish per load.

At first, liver for the hatcheries was donated. Later it cost a nickel a pound. Now, bought in huge lots for around 40-50 cents, it's mostly stored at the Department's central refrigeration plants.

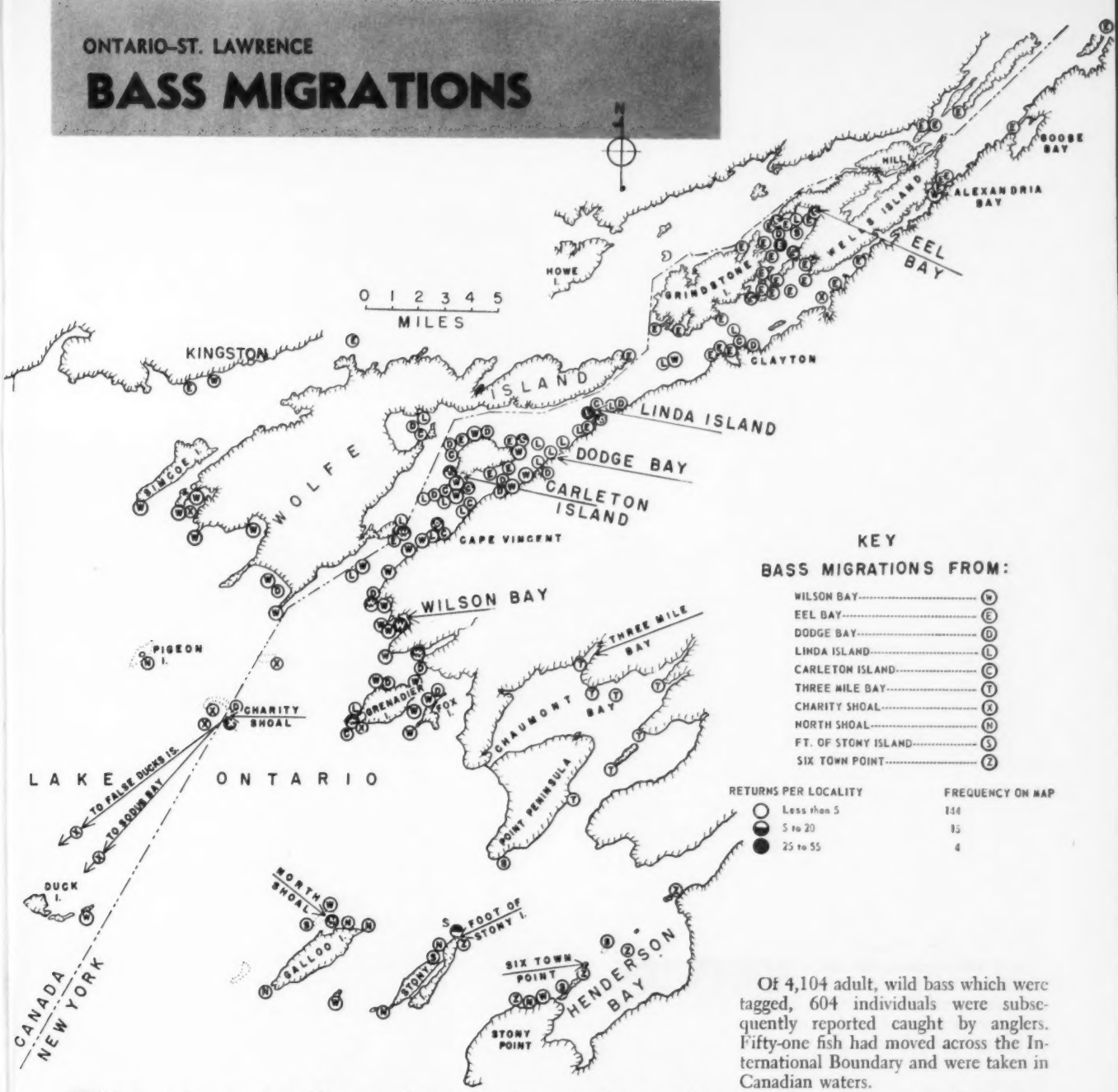
Today the fish distribution trucks often still leave the 21 modern hatcheries at midnight. Hatchery men still forcep out dead eggs—millions during a year—by hand, one at a time. Some varieties of eggs are still stirred all night with a turkey feather. Art Redband and Stan Walters and the many other veterans still wear heavy boots and have their hands in cold water most of the year. They still work on the nets, keep charts, scrub the screens, worry when a fish acts finicky and hope plenty of helpers are on deck when the fish trucks reach the streams.

Back in 1891 the N. Y. State Fish Commissioners reported ten anglers in the Adirondacks and Catskills to every one five years previously and that despite this, the Caledonia Hatchery alone was "capable of producing all the fish necessary for stocking the waters of the State." They stuck their necks out. Today, the Empire State's 21 streamlined hatcheries produce nearly a half-million pounds and the end isn't yet in sight. Brother Green started something.

—Clayt Seagears, R. B. Miller

ONTARIO–ST. LAWRENCE

BASS MIGRATIONS



THE State's largest and probably most productive smallmouth bass fishing area is in the eastern Lake Ontario-St. Lawrence region. Such an important resource must be properly handled.

Tagging of wild, adult bass has been one method used to find whether populations are homogeneous or possibly need management of local, specific type. Data obtained indicate presence of distinct, local populations. The Charity Shoal bass are an example; it is believed that most of them stay within a radius of a few miles from this isolated shoal, but at times range into the surrounding deep water. The distinctness of the Charity bass from inshore (Wilson Bay) or river (Eel Bay) populations is shown also by differences in their rate of growth and year class abundance.

Although at times there is an intermingling of bass from inshore areas of the lake with bass from the river, there appear to be resident populations of bass in Wilson Bay and Eel Bay. None of the Chaumont Bay tagged bass has ever been reported in the St. Lawrence River, or vice versa.

Of 4,104 adult, wild bass which were tagged, 604 individuals were subsequently reported caught by anglers. Fifty-one fish had moved across the International Boundary and were taken in Canadian waters.

Unusual instances of migration are as follows: A bass tagged at East Charity Light and recaptured at Black Buoy in Sodus Bay travelled 59 miles in 13 months; one tagged at the foot of Stony Island made 37 miles to Eel Bay in seven days; a Wilson Bay bass made 30 miles to Alexandria Bay in 51 days.

The map illustrates the considerable accumulation of records on bass migration and, incidentally, furnishes a guide to some of the best fishing grounds in the region.

—UDELL B. STONE

Housing Project

FORTUNATELY for the legions of hunters in New York State, the cottontail is a most adaptable creature. It is found over most of the State except the higher parts of the Catskill and Adirondack regions, even in thickly populated cities. In their food habits, too, cottontails exhibit their adaptability. Most plants occurring in cottontail range have been recorded in their diet. Best of all, rabbits are endowed with a high reproductive capacity and are capable of withstanding a heavy hunter drain.

The very existence of this range of adaptability, however, tends to obscure the fact that cottontails have definite preferences and tolerances in food and cover which distinguish good habitat from poor and which pre-determine their abundance in these habitats. The carrying capacity of the land limits the relative abundance of a game species and reflects the quantity, quality and distribution of available food and cover.

Why are some coverts so much more productive of rabbits than others, and why are some no longer producing as they once did?

Cover succession, constantly in operation, is a clue to the answer. Unmanaged grassland, in a few years, becomes brushland which later becomes woodland. Throughout the process ground shading becomes increasingly acute and ground cover gradually disappears. So does the cottontail.

Best year 'round conditions for rabbits exist in that stage of natural cover succession when the grasslands which provide summer food and nesting cover are equalled in area by the brushland and open woodlands which provide shelter and winter foods. The greater the interspersion of the various types of cover the greater is the capacity of the land to produce healthy rabbits.

A few ways of producing a high quality environment for cottontails are illustrated in the composite drawing and photographs. Discussed briefly below, they include methods of hastening, arresting, or reversing normal succession to create a balance of food and cover for increased carrying capacity.

1. Fencing of woodlots to exclude livestock is good forestry and good land use. Resultant undergrowth, released by the elimination of browsing, is also good for rabbits. Multiflora rose as a fence provides additional escape and travel cover, plus winter food.

2. Conifer plantings are much used by cottontails for cover so long as lower branches persist to form low, thick shelter. These plantings are best in clumps or narrow shelterbelts. Solid block plantations are less desirable as side branches soon interlock to shade

BRUSH PILE: *Criss-cross butt ends over stumps to provide space underneath. Pile brush high near the winter food supply.*

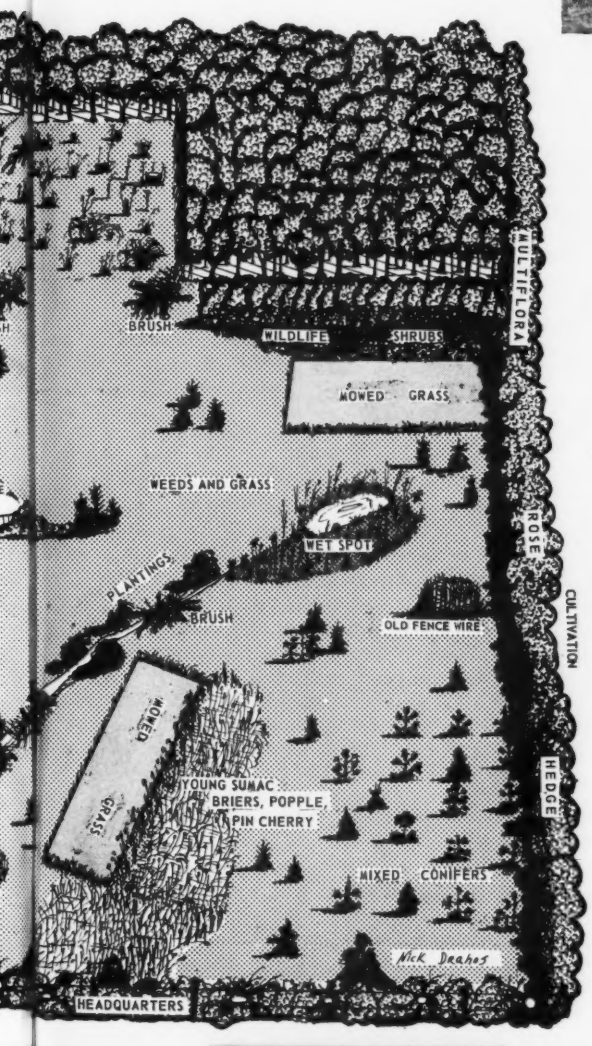
OLD WIRE FENCE: *Ideal for nesting or escape cover. Plants grow through mesh of the wire.*

CONIFER PLANTING: *Small clumps or narrow shelterbelts provide escape cover and travel lanes to food. Note protective cover of lower branches near ground.*

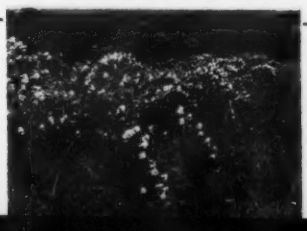
STUMP HEDGEROW: *Stumps make excellent woodchuck den locations. Blowdown or old orchard stumps are excellent for use here.*

for Rabbits

Clear cutting or thinning operations in woods provide sprout, sucker and brier growth as winter food. Note brush-pile in foreground. Why burn brush?



***YOUNG SUMAC** (above) is a preferred winter food. Old sumac stands (below) should be cut to maintain a young growth. Note stand of briers coming in where old sumac was thinned. Unthinned sumac stand at right is devoid of briers.*



***MULTIFLORA ROSE:** Excellent as a woodlot fence, winter food, escape or travel cover. See article Oct.-Nov. 1950.*

out undergrowth. Heavy thinnings of block plantations prolong use by creating openings in which herbaceous and shrub growth may thrive.

3. Shrub plantings hasten cover succession in large open fields. They should be planted near conifers or other escape cover.

4. Willow cuttings planted for stream bank and gully control also furnish good winter food and cover.

5. Clear cutting of stands of temporary or weed tree species produces thickets of suckers and sprouts, including briers. These also provide twigs, buds, and bark as winter food. Mature stands of trees provide neither undergrowth shelter nor food. Cutting staghorn sumac is especially recommended since its bark, twigs, and young shoots afford preferred winter food. Although a common species throughout cottontail range, it often is not in available form. Mature sumac offers little to rabbit welfare. By cutting it, vigorous sprout and sucker growth, plus briers, results, producing food and cover.

6. Construction of brush piles from tree cuttings near feeding area furnishes desirable shelter. A stump, large logs, boulders or a barrel may be used as a base to hold up and prolong a brush pile's effective life. The piles should be large and thick enough so snow does not cover or fill them in to render them ineffective. Orchard trimmings piled high make ideal cottontail hangouts.

7. To create retreats from predators and the elements where woodchuck dens are scarce, artificial burrows can be made with rocks, tile drains, or old lumber.

8. Grass strips 10-15 feet wide bordering escape cover may be maintained. They should be mowed often enough to keep taller plants from crowding out the more desirable summer food grasses and legumes. Where desirable foods are not present, small food plots can be established by cultivation.

9. Food and cover units should border each other. During critical periods this factor can determine the difference between mortality (due to predation or exposure) and survival until the breeding season.

APPLICATION of any or all of the above mentioned measures adds up to improved housing for cottontails. It means habitat improvement to yield spring nesting cover, succulent summer foods and abundant winter foods adjacent to dense shelter and escape cover. Above all, it means creation of an environment to favor increased production of that popular brush buster, the cottontail.

—Nick Drahos, Joseph Dell

RESULTS In Baker Valley

By Robert A. Reed

A complete watershed conservation program pays off—

IN Baker Valley, which is in the central part of the Allegany County Soil Conservation District, a complete watershed conservation program has brought the results predicted in a very short period of time. On land once nearly abandoned, private enterprise—guided by sound planning—has brought changes both startling and satisfying.

Since 1933, when conservation work was begun in this watershed with the reforestation of land owned by the State, there has been a noticeable stabilization of stream levels. The reduction of peak flows, always a problem here, has been particularly apparent in the last four years. It has come as a direct result of the fact that the State reforestation program has been tied in with soil and water conservation work planned and supervised by technicians of the Soil Conservation Service.

This recent reduction of flood peaks on the streams in the watershed has resulted at least in part from the construction of six ponds, all of which have flood water storage facilities. Figures show that these ponds held back over five million gallons of water this spring during periods of high run-off. Present plans call for the construction of several more ponds on the watershed.

The need for such measures is of distant origin. Back in the days when Indians roamed the 1,983 acres now known as Baker Valley, the ground cover consisted mostly of virgin pine and hemlock forest. History records that under such ground cover there were no floods on the upper reaches of the small watersheds.

Through the years, however, the white man cleared about 1,600 acres for pasture and crops. As the land came under cultivation and was shorn of its protective covering, the stream bank cutting and gullying became more and more destructive, until in later years every freshet required stream bank and fence repairs, as well as channel maintenance work.

To correct this situation, land use changes and protective measures were established as shown in the accompanying table.

The figures in this table show an 80 per cent change in land use in the watershed, as dictated by the requirements of sound soil and water conservation planning. According to Lynn L. Watson, the owner of the largest individual farm acreage in the valley, this conservation work has resulted in a marked change in water run-off habits. He reports the following items which have come to his attention:

1. The stream banks have not had to be repaired or rebuilt due to washouts.
2. Streambank fences have not had to be repaired.
3. One stream on his land which used to go dry flowed all summer in 1949 (a drouth year).
4. The stream level has not fluctuated as much as in former years.
5. Adjoining fields have not been flooded.
6. What was formerly a swamp near his house has been converted into two ponds; in 1949 the level of these ponds was maintained, indicating a high water table.

These are some of the reasons why Mr. Watson is strong for watershed conservation. As pointed out above, his lands (over 600 acres) represent the largest private holding in Baker Valley. The balance of the watershed is made up of State forest land, smaller privately owned forests and another dairy farm. Of the private holdings covering 12 properties, all have co-operator agreements with the Soil Conservation District prepared by Soil Conservation Service technicians.

The entire watershed is now in protective cover, either as a result of contour strip cropping with diversions, terracing and proper planting, or as a result of reforestation or the encouragement of natural stands.

On the private holdings, pastures have been improved with better legume mixtures, woods have been protected from grazing, trees have been planted on idle acres, diversion terraces and strip cropping have been installed on cropland, and woodland acres have been improved by selective cutting. Over 10 miles of firebreaks have been established and are being regularly maintained to protect the reforested areas. In fact, the first fire breaks known were planned and built by Bob and Catherine Reed on their farm.

In addition to these practices there have been established the six water control ponds mentioned earlier. They permit more profitable use of the rainfall, and stop the quick run-off. Beaver have been introduced and have developed two more ponds. All these water impoundments are used for fire protection, recreation, irrigation, spray water, game management and flood control.

The means of accomplishing this big watershed conservation job have been many. The New York State Conservation Department, through its Division

Major Land Uses	Before Conservation	Planned Conservation	Amount Done
Acres in Pastured Woods	439	.....	....
Acres in Unpastured Woods	311	750	750
Acres in Idle Land	731	40*	....
Acres in Cropland	328	.....	....
Acres in Contoured Cropland	.....	240	240
Acres in Grassland	.....	88	88
Acres in Pasture	174	30	....
Acres in Improved Pasture	.....	80	110
Acres in Reforestation	.....	743	575
Acres in Ponds	.....	12	17**
Total Acres in Watershed	**1,983**	**1,983**	

* Reverted to forest.

** These 5 additional acres were accounted for by beavers, which own and operate two of the finest and most effective ponds in the watershed.

of Lands and Forests, has an excellent program established on its lands, including woodland improvement, reforestation and water holding ponds (Palmer Pond). The Department's Fish and Game Division has cooperated through the release of beaver on private holdings, in conjunction with the work of the Allegany County Soil Conservation District. The Soil Conservation Service has made available technical assistance in planning conservation measures for co-operators with the Allegany County Soil Conservation District. Supervision for installation has been made available from the same source.

And fencing and tree planting assistance has been made available through the Conservation Department's Wildlife Restoration Program (PR-48-D).

This program, utilizing federal funds from the Pittman-Robertson Act, has stimulated the completion of those soil conservation measures which directly or indirectly improve game conditions. For it is agreed that land management practices such as tree planting, marsh development and woodlot fencing not only slow water run-off, but also supply cover that is utilized by most of our game species.

The Agricultural Teachers, Future Farmers of America and 4-H have cooperated on the tree planting program, thereby making it possible for farmers to get their land planted by the District for $6.30 per thousand trees. The Extension Service, Farm Bureau, and Production and Marketing Administration have co-operated by holding field days in the valley. Such events encourage participation by individuals who "have to be shown" and they have made clear the necessity for full scale co-operation between individuals and government agencies in establishing broad conservation programs.

Recently, owner Lynn Watson donated 10 acres of land to the Belmont Conservation Club, Inc. for the use of club members and friends. This game management area now features a complete conservation program on what was originally thornbrush pasture. A pond 14 feet deep with a surface area of one and one-half acres has been constructed by the Allegany County Soil Conservation District with State approval. It has been stocked with several varieties of fish on an experimental basis. The pond is fertilized and managed according to the best known principals of fish management, and it also has an island for duck nesting, with a wood duck nesting box placed there by Soil Conservation personnel. The adjoining area has been reforested to a variety of evergreens, bordered by four rows of shrubs and a multiflora rose fence. As Leo Mulligan, President of the club, puts it: "The idea in Club sponsorship of the area is to set an example of the best in conservation measures to increase wild game production by placing more cover on the land."

That's a good idea, and its working. The Allegany County Federation of Sportsmen's Clubs has used the area for tours of sportsmen to show the types of work recommended and how they may best be accomplished. In fact, the President of the Federation owns a 67-acre farm in the watershed, with all the needed soil and water conservation measures established and functioning on every acre of his farm. That, essentially, is the goal of conservationists—each acre used for the purpose for which it is best adapted.

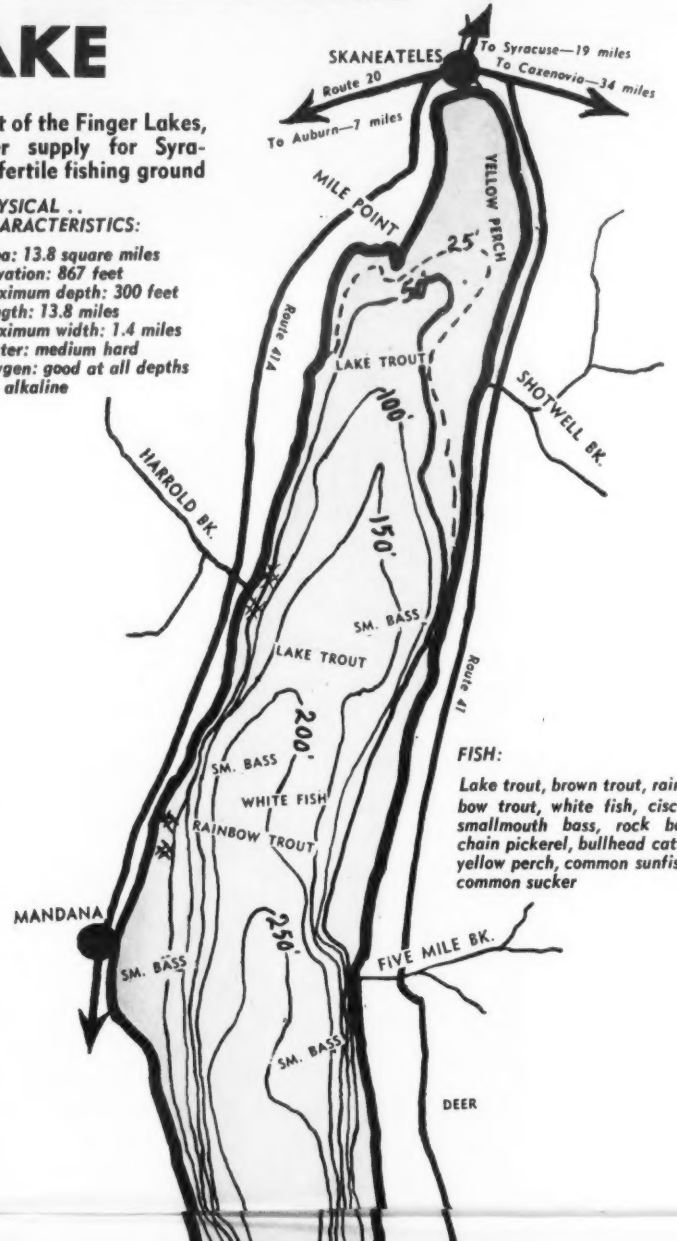
THE Baker Valley Watershed is only one of about 300 similar watersheds in Allegany County. And undoubtedly, it is typical of thousands more elsewhere in New York State. As to what has been *done* in this watershed—Baker Valley is concrete proof that conservation can put idle and tax delinquent lands back into production and back onto the tax rolls. As *everybody* knows a productive land presents a stable base for taxation. And as those people know who have witnessed the transformation of Baker Valley, a land restored to productivity conveys rewards much greater than can be expressed in dollars and cents.

SKANEATELES LAKE

Clearest of the Finger Lakes, a water supply for Syracuse, a fertile fishing ground

PHYSICAL .. CHARACTERISTICS:

Area: 13.8 square miles
Elevation: 867 feet
Maximum depth: 300 feet
Length: 13.8 miles
Maximum width: 1.4 miles
Water: medium hard
Oxygen: good at all depths
Ph: alkaline

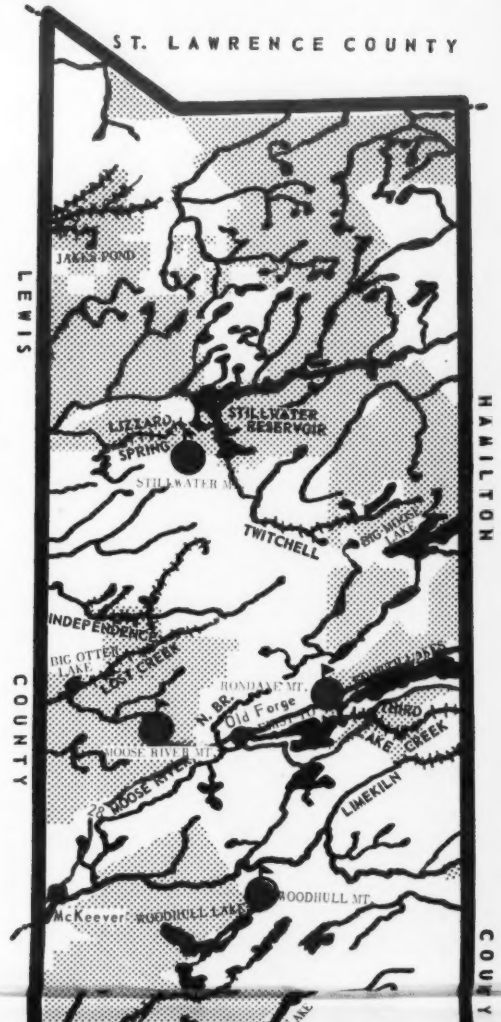


FISH:

Lake trout, brown trout, rainbow trout, white fish, cisco, smallmouth bass, rock bass, chain pickerel, bullhead catfish, yellow perch, common sunfish, common sucker

HERKIMER COUNTY

A long stretch—from civilization in the fertile Mohawk Valley to the heart of the Adirondack wilderness



Only those streams receiving more than 600 trout could be named on the map, while many lakes and ponds had to be omitted. More than 300,000 trout are stocked each year, of which over 200,000 are brook trout. In addition, the Mohawk River receives about 600,000 walleye (pikeperch) fry. Last year, 30,000 smallmouth bass fry and 50,000 two-inch red salmon were stocked.

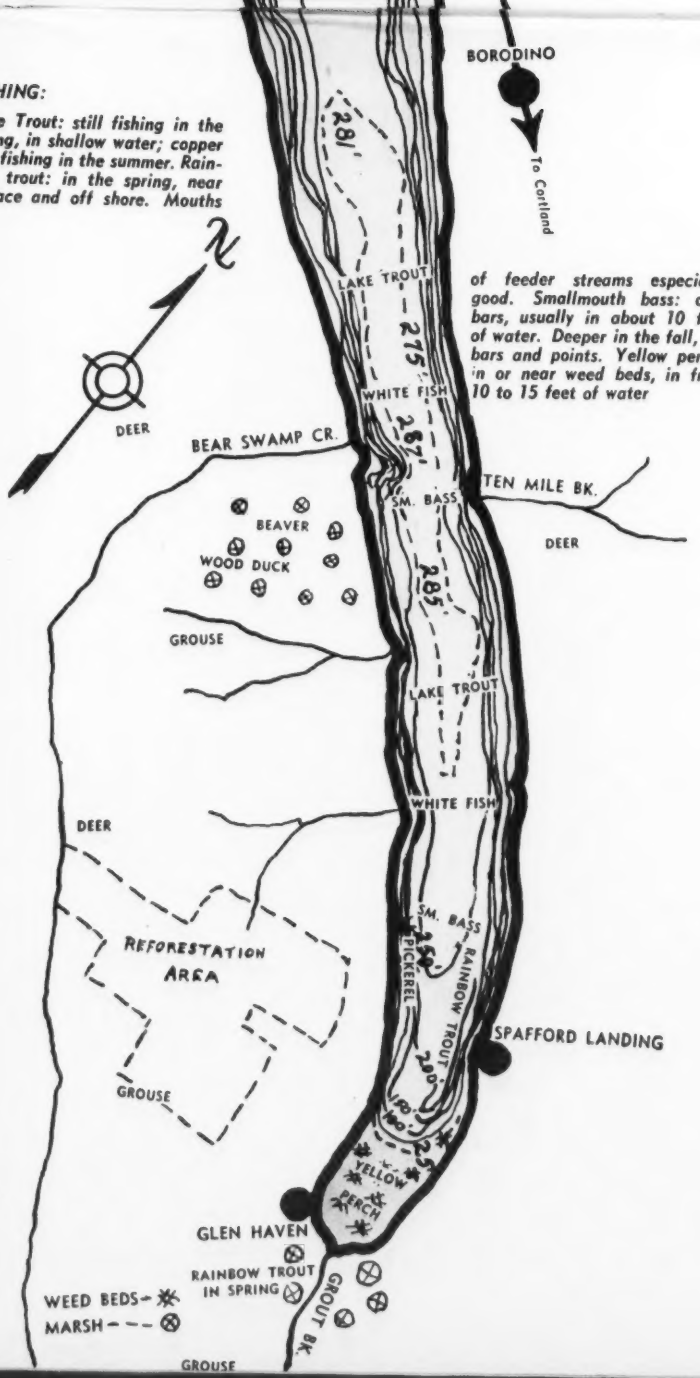
Public fishing is allowed in all waters in the State-owned land and on the public fishing-rights sections of the East and West Canada, Black and Beaver Rivers and West Branch of the Oswegatchie.

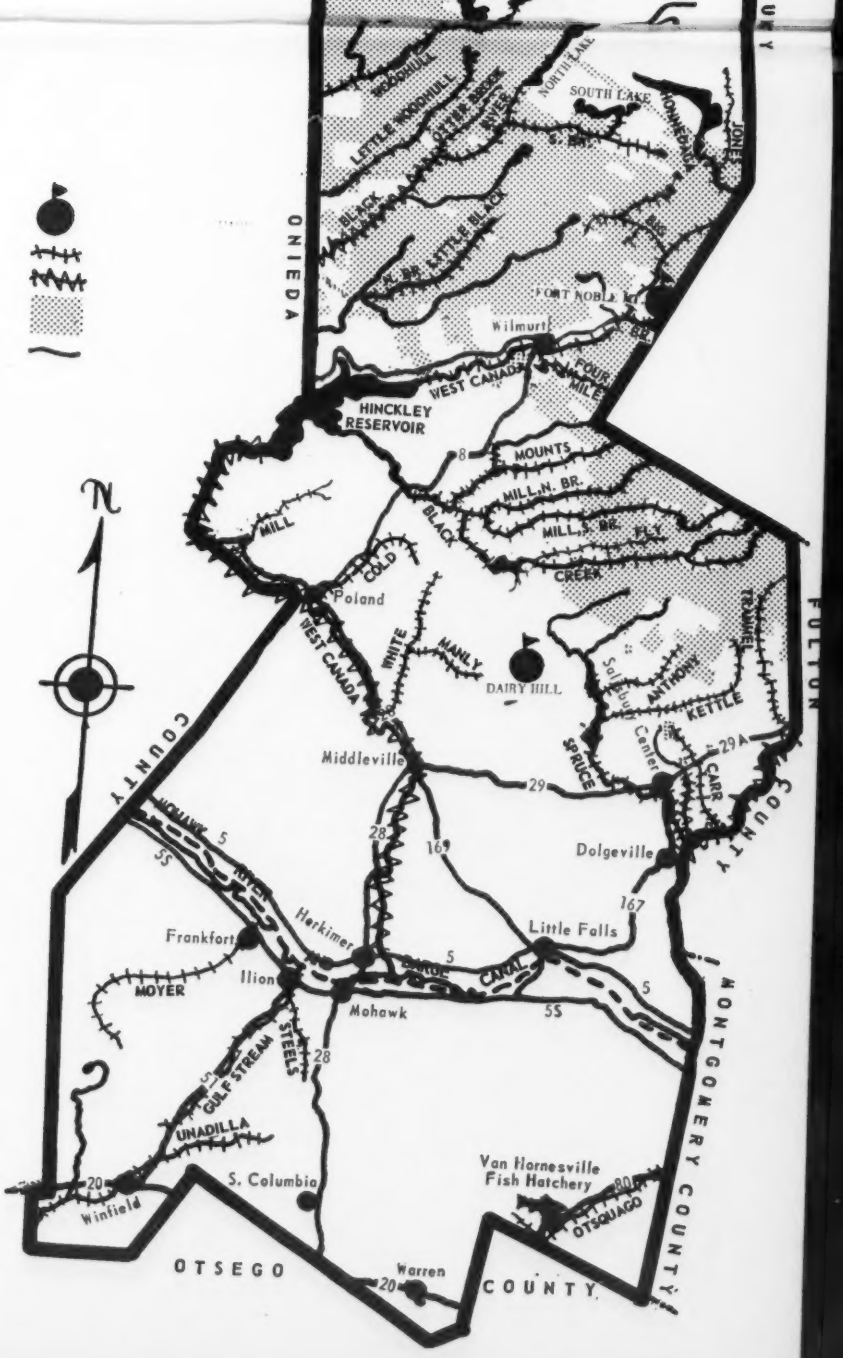
While there are no public campsites, there are lean-tos along the famous canoe route which starts at Old Forge and goes through First to Fourth Lakes. For detailed information about the trails, canoe routes, and the complete stocking list for the county, write to the Conservation Department, Albany 1, N. Y.

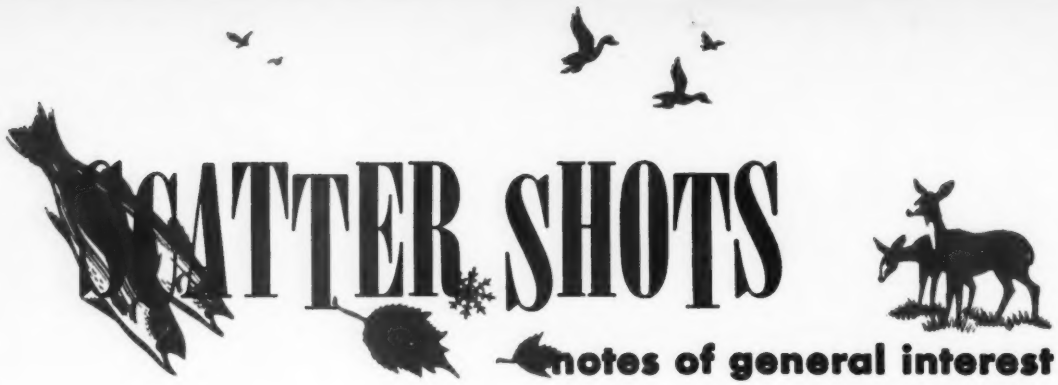
Because of the bad blowdown last November, many sections may be closed to all forms of recreation. Therefore, check with local Forest Rangers, Game Protectors or other officials before starting into the wilderness areas.

FISHING:

Lake Trout: still fishing in the spring, in shallow water; copper line fishing in the summer. Rainbow trout: in the spring, near surface and off shore. Mouths of feeder streams especially good. Smallmouth bass: over bars, usually in about 10 feet of water. Deeper in the fall, off bars and points. Yellow perch: in or near weed beds, in from 10 to 15 feet of water







BEAVER AND OTTER SEASON

During March of 1951, 30 counties were opened by Department order to the taking of beaver and 11 counties to the taking of otter. The total take of 6,002 beaver by 1,895 trappers represents an all-time high in the number tagged by the State's Game Protectors. The relatively low takes during the February season which prevailed during 1949 and 1950 resulted in a considerable surplus being available during the past season, and in certain parts of the northern section of the State the population before the open season had assumed very high levels. The Department was anxious to see a reduction of these excessive numbers to more nearly normal levels because of the rapid increase in the number of complaints of beaver doing damage.

The season has undoubtedly resulted in some reduction in the number of complaints received, particularly in the Ontario-St. Lawrence region. However, it is interesting to note that in the South Central District, of 11 complaints received by District Game Manager Paul Kelsey at Ithaca this year up to May 15, only one represented a new dam location. District Game Manager John Nemes of Syracuse reports damage complaints coming in regularly during the past few weeks. Greenleaf Chase of Saranac Lake thinks that the beaver complaint situation was not generally alleviated by the season and reports that the central Adirondacks, parts of Hamilton, Herkimer and western Essex counties apparently still have higher than desirable populations.

In spite of a record take and a marked reduction in populations in certain counties, the State as a whole still has a high beaver population and another season in the same counties will not have to be deferred for long, if at all. However, the coming fall and winter survey should indicate more clearly what the situation is in these counties and in those not opened this year. This survey, and the reports of damage received this year, will indicate entire season needs.

The otter season in 11 counties coincided with the beaver season. This spring's take (123 by 98 trappers) was the highest since both spring and fall open seasons began in 1949. The take is relatively low in proportion to the population present. Indications are that seasons similar to those which have prevailed for the past few years should be continued for some time.

SPRING TAKE, 1951

County	OTTER	BEAVER
	No of Pelts Taken	
Broome	*N.S.	58
Cattaraugus	N.S.	175
Chautauqua	N.S.	327
Clinton	1	243
Chemung	N.S.	1
Chenango	N.S.	50
Cortland	N.S.	25
Essex	14	279
Franklin	23	723
Fulton	N.S.	178
Hamilton	29	775
Herkimer	10	379
Jefferson	....	509
Lewis	6	362
Livingston	N.S.	14
Madison	N.S.	34
Oneida	12	108
Onondaga	N.S.	10
Ontario	N.S.	16
Oswego	2	103
Rensselaer	N.S.	92
St. Lawrence	23	873
Saratoga	N.S.	130
Schuyler	N.S.	35
Steuben	N.S.	126
Tioga	N.S.	11
Tompkins	N.S.	31
Warren	3	262
Washington	N.S.	52
Yates	N.S.	21
Totals	123	6,002

*N.S. represents no open season.

PROTECTED (?) WILDFLOWERS

After a study of the State penal law provisions with respect to the safeguarding of certain rare wildflowers (and we pay tribute to the excellent article on the law and its operation which appeared in THE CONSERVATIONIST for April-May 1950) there remains considerable unrest in the mind of the conservationist who has the fate of these flowers at heart.

One question has to do with the enforceability of the law. Assuming that the State Police and other peace officers involved are acquainted with the law and are constantly mindful of just which plants it covers and under what circumstances, are they familiar with the *plants themselves*? Are they briefed on identification of the hart's tongue fern or the pink ladyslipper, for instance? If not, how *can* they enforce the law?

A question of another sort arises when construction invades the stand of a rare plant. If it becomes necessary to widen a road, is legislation going to save a stand of fringed gentian or arbutus along the wayside, even if these plants are protected on public lands? If white ladyslippers and hart's tongue fern already occupy a site chosen for a housing development or an industrial development will the law save the plants, even though they are protected on private lands in certain counties?

It seems obvious that the law is desirable insofar as it draws to the attention of the public the fact that the plants it covers are valuable, rare and should be safeguarded; but otherwise, it is of dubious effectiveness. From our contact with those who have studied the problem of native plant protection as it is carried on in other states, it seems apparent generally that protective laws cannot assure the preservation of these valuable plants.

Probably the only reasonably sure way of saving rare plant life in this or any state is by setting up plant sanctuaries where these plants are found to grow. Such sanctuaries could more readily be kept under the watchful eye of enforcement officers than could an undesignated area.

In the final analysis, however, education of the public on the importance of saving this natural heritage holds the key to the problem. We who have pushed such education at every opportunity for many years feel that some progress is being made in this direction and that more and more adults and children are coming to know and cherish the wild things which are part of our natural endowment. Education must go on endlessly and must be pressed vigorously through every possible channel. The work of THE CONSERVATIONIST in bringing this problem before its readers is most heartily to be commended, and we hope it will continue.

—MARY M. SLIFER,
Conservation Committee Chairman,
Federated Garden Clubs of N. Y., Inc.

A BIG DAY IN SCHOHARIE COUNTY

This photograph was sent us by Donald H. Martin of Flushing. It was taken by his father about 40 years ago, and shows appropriate costuming, game and photographic stances for the period

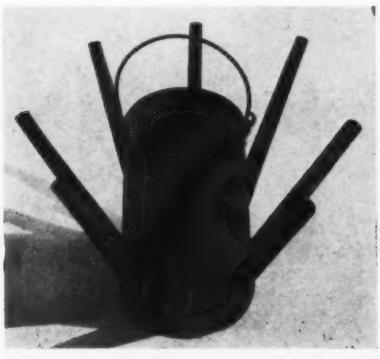
FOLLOW-UP ON COYOTES

A reconnaissance was made during the late winter and early spring months throughout the Adirondacks and foothills to keep tabs on the coyote. In the east the animal has spread through Clinton and Essex counties to the Lake Champlain Valley, and through Warren County to the Tongue Mountain section. In western Warren County, coyote activity has gradually increased to a high density. Northern Saratoga and Washington counties were checked and tracks and other signs discovered.

On the other hand, March reconnaissance in the Counties of Lewis and Jefferson showed coyote signs to be scarce; in Lewis County, between Harrisville and Croghan (where coyotes had been much in evidence last summer) signs of their presence were scant. Likewise, in the Rainbow Falls section in St. Lawrence County no sign was reported during March although complaints of coyote depredations have emanated from this section in the past. But north and south of the Brantingham Lake section in Lewis County considerable evidence of coyotes was found. And careful reconnaissance in the Townships of Ohio, Russia and Norway in Herkimer County and Forestport, Boonville, Remsen, and Trenton revealed their presence there.

Following the winter and early spring surveys of abundance several trial traplines, particularly in sections of Oneida, Herkimer, Lewis and St. Lawrence counties, were established, but with little success. Past experience has indicated that the late summer and fall period was the most productive time to trap the coyote, and this spring's experience seems to confirm this. Furthermore, during this spring period our trappers had great difficulty in locating coyote dens. Dens which had been used last year proved to be unoccupied.

It is during the latter part of the summer and fall that complaint areas become defined. Insofar as possible, such complaints will be handled by having a skilled State trapper establish the original trap line, and then having the owner maintain it, with periodic visits from the trapper. This method if successful, will enable Department trappers to cover widespread areas with the greatest effectiveness.



From McDonald's boat livery at Tupper Lake comes this antique deer-jacker's lantern. With a wick in each spout, the thing burned kerosene

EARLIEST (?) PRIVATE STOCKING

"In 1818 the legislature having passed an Act prohibiting fishing three years in this [Kinderhook Lake] and other lakes in the county [Columbia], General [Charles] Whiting initiated and carried through the stocking of these lakes with pickerel. Fifty-six persons, subscribing from a shilling to $5 given by Whiting and Clark gave $48 for which 48 pickerel were bought of Enos Smith of Stockbridge. Twenty-three of them were placed in Kinderhook Lake and were the progenitors of the many thousands which since that time have delighted (or disappointed) the thronging disciples of Isaac Walton."—From Edward A. Collier's *A History of Old Kinderhook*, Chapter II, Physical Features, Boundaries, Population.

ERRATUM (VERY)

The Forest Preserve was acquired a good deal more cheaply than we made out in our last issue (*Within and Without the Blue Line*). We said then that the total cost was approximately $200,000,000. We threw in an extra zero and shuffled the commas; the correct figure is $20,000,000.

PLENTY GULLS

The annual census of nesting Ring Billed gulls *Larus delawarensis* on Little Galloo Island, indicates a nesting population of 48,000 gulls. This is based on a sample technique used by John Belnap of the North County Bird Club. A total estimate of 24,000 nests on the island (which is less than 50 acres) was made on May 13. It is reported to be one of the largest Ring Billed nesting concentrations in the country, and if it isn't, we think it should be. It appears that they would have to lay and incubate in shifts to get a job this size completed.

Any ideas along the lines of gull omelets are out; they are protected.

BOW HUNTING REPORT

County	1948	1949	1950
Allegany	3	...	2
Cattaraugus	...	3	1
Chautauqua	...	1	1
Cortland	...	...	1
Delaware	...	...	1
Erie	...	...	1
Orange	...	1	1
Rockland	...	...	1
Seneca	...	...	2
Schoharie	...	1	...
Tompkins	...	1	4
Ulster	...	1	...
Westchester	6	10	17
Yates	...	...	2
Total	9	18	34
Licenses	853	709	958

MINNIE'S BIG SISTER

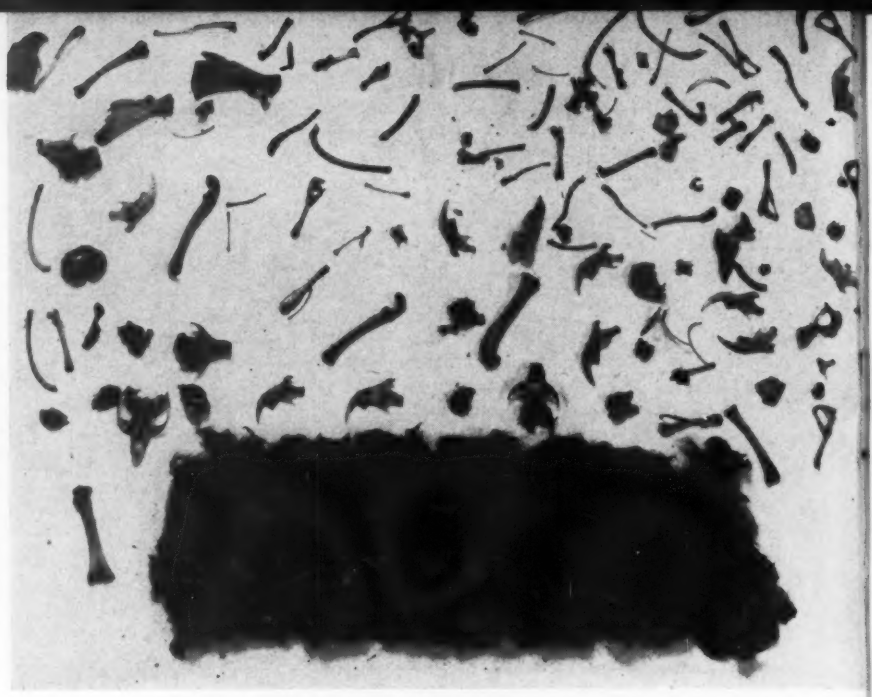
Minnie Methuselah, the famous Chautauqua Lake muskalonge, may now have to take a back seat and vacate the front one in favor of a big sister. When last seen, Minnie measured 49 inches. But Big Sister, netted this spring for her eggs and then returned to the lake, measured 52½ inches.

Nobody at the Bemus Point Hatchery has ever seen or heard of a muskalonge that big in Chautauqua. But then nobody knows what Minnie's been doing for the past couple of years.

MODEL A BAILEYS

Spring is cleanup time and up in the North Country anything goes. Or almost goes. A gent supervising the loading of some waste papers last week in Glenfield, fearing they would blow off the truck, decided to throw several Model A seat springs on the load to hold the papers down.

The seat springs turned out to be Bailey live traps for beaver that the State trapper had just cleaned and waxed and set out to dry. The woodswise truck driver salvaged them.



DINNER FOR BARN OWLS

Above is a photograph of what an English barn owl eats. It was taken by Melville Nicholas of Rosevear, Magwan, Helston, Cornwall, England, and we came across it in a good British journal called *County Sportsman*. We wrote the editor, who wrote the photographer, who wrote us, who wrote to Prof. Bill Hamilton at Cornell to see if British barn owls ate the same as ours, who wrote back:

The photo of the barn owl pellets is an excellent one, sufficiently sharp so that most of the bones may be recognized. The remains of skulls, jaws and pelvic bones of five field mice, *Microtus agrestis*, are evident. Less apparent are the skulls of two shrews, one near the center of the picture and another to its right. The shrews are apparently of two different species of the genus *Sorex*. In the upper left are the shoulder bones of a rat, and leg bones of the same animal in the center and lower left.

The barn owl is virtually cosmopolitan. Its food consists largely of small manmals. These birds bolt their food entire. After digestion, the bones and fur are wadded into a pellet and "vomited." Occasionally one may recover a bushel or more of these castings in a church belfry or other nesting site. A good friend to have about. This is one Britisher who is not rationed for meat.

CONSERVATION FOR CREDIT

At this time of year, our correspondence from teachers of New York State takes on new life. The reason: a perennial question, "Where can I take a course in Conservation this summer for credit?"

We are very glad to say that this summer no New York State teacher will have to travel far to enlarge his conservation horizons—for credit. To take a course or workshop in Conservation this summer, or to learn more about any of these offerings, write to the Director of Admissions of any of the institutions listed below. As the dates indicate, you shouldn't wait long.

Albany State College for Teachers	Albany, N. Y.	July 2–August 24
Buffalo State College for Teachers	Buffalo, N. Y.	July 16–July 27
Cortland State Teachers' College	Cortland, N. Y.	August 13–August 29
Fredonia State Teachers' College	Fredonia, N. Y.	July 2–August 10
Geneseo State Teachers' College	Geneseo, N. Y.	July 16–July 27
New Paltz State Teachers' College	New Paltz, N. Y.	July 2–July 20
Oneonta State Teachers' College	Oneonta, N. Y.	July 2–July 14
Oswego State Teachers' College	Oswego, N. Y.	August 13–August 24
Plattsburg State Teachers' College	Plattsburg, N. Y.	July 2–August 10
Saint Lawrence University	Canton, N. Y.	July 2–August 10
Cornell University	Ithaca, N. Y.	July 2–August 11

Salvage Report (3)

SINCE the opening of the first nine bids on March 25, the Department has advertised an additional 72 projects for fire hazard reduction through timber salvage operations in the Adirondacks and Catskills, bringing the total advertised project areas to 81. In addition, 10 other areas in the Catskills are now being advertised in the public press for the opening of bids on June 15.

The several bid openings have resulted in Commissioner Duryea giving his approval to the execution of 41 separate contracts, located in Delaware, Lewis, St. Lawrence, Herkimer, Onedia, Essex, Franklin, Hamilton, Warren, Washington, Greene, Sullivan and Ulster Counties. Hamilton County leads with 13 contracts. All together, the contracts include an estimated 115,200 cords of pulpwood, 4,879 MBF of softwood sawlogs, and 6,365 MBF of hardwood sawlogs. Experience to date indicates that the estimates upon which the contracts were based will, in most cases, very substantially overrun. The total contract consideration approaches half a million dollars.

As reported previously, Department personnel have had a major chore to perform. This job consisted of the opening and fireproofing of some 650 miles of marked and signed recreational trails, the opening of 150 miles of trails to fire observation stations together with the reconstruction of the telephone lines following them, the reduction of fire hazard on 32 small areas adjacent to highways. In addition, the fire truck trails in the Adirondack area had to be opened and there was a million feet of saw timber down on eight public campsites, mostly in Hamilton and Warren Counties.

All of these operations have progressed as rapidly as weather and manpower have permitted. A number of the most critical roadside blowdowns have been cleaned up, fireproofed and marked with signs. A good number of the major recreational trails in the High Peak area have been opened and fireproofed and were available to the public over the Memorial Day holiday. The main trail which has not yet been opened is the Northville-Placid trail.

The situation at present is that all of the campsites are open and ready for business. Trails to fire towers and telephone lines have been almost 100 per cent rehabilitated, and all fire truck trails are open. The recreational trails still closed to public use are relatively few, and more are being opened as time and availability of labor permit.

In spite of the progress which has been made, the situation is still a dangerous one. In the Cold River-Raquette River area, the fire hazard is so extreme that it was necessary to close this section to the public, and other sections—although not so dangerous and not closed—are nevertheless highly inflammable. All persons planning trips away from public highways should first check with the local representatives of the Conservation Department in order to determine whether or not the access trails are safe to use. And everyone is cautioned to use the greatest care with fire wherever they may be in the Adirondack area this summer. A camp fire left in a presumably safe place might reach one of the extensive blowdown areas if it should escape. The forest fire fighting force of the Department has been supplemented by additional seasonal men and by the purchase of a large amount of additional fire fighting and fire detection equipment, and the force is on its toes. But it cannot do the job alone.

In view of what all of us have at stake in the Forest Preserve, we are sure we can count on the fullest co-operation of the public.

FOR YOUR INFORMATION

BETTER GIVE A DINNER

There's a lot of fish and game being held in the frozen food locker plants that cannot be possessed after July 1st.

The Legislature repealed Section 170a of the Conservation Law, under which possession of carcasses of birds (except migratory birds), fish and quadrupeds after the close of the open season therefor was permitted. In reenacting the section, the Legislature made no provision for the continued possession of game already in the freezer.

The new section takes effect July 1st and *applies only to what's taken on or after July 1 this year;* it permits possession and transportation of wild game birds (other than migratory) and quadrupeds (except deer and bear) during the open season and for 60 days immediately following; permits possession of deer and bear during season and until March 1st following; fish any time, except trout, black bass, muskalonge, salmon (these until March 1st following). But it provides that after the expiration of the possession period an additional period of not more than 60 days may be granted by the Department (except deer and bear may not be possessed even with the permit beyond August 25th) providing application for a permit is made five days prior to the end of the original possession period.

Of course, the fish and game may not be held in storage in any place other than the home or residence of the person having lawful title to them unless they are identified with a tag bearing the signature and address of the taker. (Tags must be furnished by the taker; the Department does not issue them.)

With the public now being acquainted with the new situation by the Game Protectors and operators of the frozen food plants, undoubtedly there'll be a lot of fish and game dinners between now and July 1st.

HUNTING SAFETY

The Kenneth A. Deering Memorial Contest to promote safety in the woods, won last year by the Ticonderoga Fish and Game Club for its educational work on safety, is now underway for 1951. A committee of Rensselaer County sportsmen headed by Bill Wright of Castleton, New York, tells us that entry blanks and full information about the contest have been sent to the secretaries of all fish and game clubs throughout the State and the date for filing contest entries has been set for July 2.

As previously reported, there was an encouraging decrease in the number of hunting accidents in our State last year, but we still have a long way to go. The Department and THE CONSERVATIONIST have made a considerable educational effort to promote gun safety and urge all clubs to get into this contest as another means of stimulating local public interest in the problem. We think that every club should have an active safety program.

TIMES (AND VIOLATORS) HAVE CHANGED

Above you see just one night's haul of illegal nets, taken from Irondequoit Bay by Special Protector Edward F. Bush. But the picture was taken in the early Thirties.

Most of the old time poachers (who made these nets by hand) have passed on, and the younger generation doesn't seem to have taken up the "art." But back in those days the County of Monroe reimbursed the Special Protectors for each net seized; the County then burned them. Protector Bush reports that with fair regularity he had to hire a trucking concern to haul the nets away.

NORTH COUNTRY DUCKS

In 1942 the first nesting record of the ringnecked duck in New York was recorded (Severinghaus and Benson) on Jones Pond in Franklin County. Since then this member of the scaup tribe has made an astonishing increase in breeding populations noted on other marshy ponds in Franklin, Essex and St. Lawrence counties.

Perhaps on Jones Pond a leveling off point has been reached in density of breeders—at somewhere around 20 pairs of ringnecks. On this 200-acre pond, of which approximately 40 acres are in marsh and bog, a progressive increase up to that number of breeding pairs has taken place until last year. This spring there are again about 20 pairs present. Interesting to note is that this newcomer has not displaced any other resident nesting waterfowl. Black ducks reside there in numbers varying from 8 to 15 pairs. Occasional broods of woodies and hooded merganser are present each year, and occasionally a golden eye. Blue wing teal also nest there, with five pairs about the high point in populations.

The ringneck arrives shortly after the ice goes out and embarks on a rather spectacular courtship. Curiously, it will tolerate man's activity to an amazing degree. On a part of Lake Flower in the Village of Saranac Lake this duck nested for the first time four years ago. This spring there are four pairs and despite traffic on the highway, boating and fishing (along with activity of a sawmill), these ducks will be seen within 150 feet of the highway. Their preference for a choice nesting site makes this bird unique among our northern waterfowl.

TREES BY THE MILLION

Seventy-three hundred orders totaling 30 million seedling trees were filled and shipped this spring from our nurseries. Scotch pine was in greatest demand (31 per cent of the total). The percentages of demand for the other species ran in this order: red pine, 21; white spruce, 19; Norway spruce, 16; Japanese larch, 7; white pine, 5; the balance of one per cent was made up of Jack pine, balsam and locust.

But that's already ancient history at the nurseries. The boys there have just finished sowing 20,400 seed beds (each 4 by 12 feet in size) to produce 40 million trees, using 3,700 pounds of seed. The larch seed comes from Japan, Scotch pine seed from Poland and Germany, Norway spruce seed from Austria, with our own State forests furnishing the white spruce and balsam seed.

DISTRICT RANGER

Division of Lands and Forests, Bureau of Forest Fire Control

Salary: $3,715 at time of appointment and increases by five annual increments to a maximum of $4,440. (In addition, a cost of living bonus will be paid during the 1951-52 fiscal year.)

Civil Service Status: Open competitive civil service examination is required. Conducted on a State-wide basis.

Positions (Number and Location): There is one District Ranger in each of the 15 Forest Districts of the State.

Promotion Opportunities: There is a direct line of promotion to the next higher position—Supervising District Forest Ranger. If qualified, District Rangers may compete in promotion examinations for District Forester.

Working Conditions: With the exception of office duties, work is performed out-of-doors the year round. It involves considerable walking in rough, wooded and mountainous country, frequently under adverse weather conditions. District Rangers work six days a week and are subject to call at any time. They receive 24 days vacation each year and earn one day of sick leave credit each month. Unused sick leave may be accumulated to a maximum of 150 days. Uniforms and necessary equipment, including car, are furnished by the Department. Reimbursement is made for expenses for travel, board, and lodging while on official business away from official headquarters.

Retirement: Membership in Retirement System compulsory. Employee contributes on payroll deduction basis. Variety of retirement benefits are offered.

Duties: Under general supervision of a District Forester, a District Ranger has charge of the suppression and prevention of forest fires in a Forest District. He supervises the work of Forest Rangers and Forest Fire Observers in fire prevention, detection, and suppression, and takes immediate charge of the suppression of serious forest fires. Supervises the construction and maintenance of all forest fire control facilities in his district including observation towers, telephone lines, camps, trails, fire lines, and fire fighting equipment and such woods structures as bridges, low grade roads, rough buildings, etc. Enforces conservation laws and regulations. Trains and instructs Forest Rangers, Forest Fire Observers, and Fire Wardens in their duties. Prepares reports and records of activities.

Qualification Requirements: *Physical:* Physically strong, active and freedom from any disabling mental or physical defects. Age: From 21 years to 45th birthday (time spent on military duty in World War II is deducted). *Education and Experience:* Graduation from college with a degree in forestry and three years of experience in general forestry work, including forest fire control; or graduation from a one year course at a recognized forest ranger school and six years of the previously described experience (satisfactory completion of two years of a four year scientific course at a recognized college or university may be substituted for the one year ranger school course).

Special Knowledges and Skills: Sufficient knowledge of forest fire control to develop an adequate forest fire protection system for a forest district. Good knowledge of forest fire hazards, the methods used to eliminate them, and the methods and practices used to combat and suppress forest fires. Good knowledge of the Conservation Law in relation to lands and forests. Good knowledge of the use of the box and pocket compass and ability to make compass surveys in tracing property lines. Ability to interpret contour maps. Ability to organize men and equipment effectively, particularly in emergency situations. Ability to meet and deal effectively with the public and to speak before public groups. Possess integrity, resourcefulness, good judgment, good character.

Next issue: *Assistant Game Research Investigator*

LETTERS TO THE EDITOR

CATS AND DOGS

Dear Editor: Two cats of a neighbor are particularly partial to robin meat as a diet and their favorite hunting ground is the broad expanse of my lawn. The neighbor is aware of what her cats are doing—not only decreasing the robin population but other song birds. Since she is making no effort to control her felines how far may one go to control them for her?

Once upon a time the syllabus used to tell you to exterminate hunting cats. Was this meant to apply only to woods? It might be well to restore to the syllabus the wording of the law, in addition to giving voice to the situation I have mentioned in the foregoing paragraph.

Name Withheld by Request,
Merrick, L. I.

Dear Sir: My compliments on your very good magazine. I have read several of your "Letters to the Editor" which complain of dogs at large. I have also been bothered by them. We live in a very small village and there are 616 licensed dogs. The village officials tell me there is nothing that can be done to keep them off my property. Surely we should have a right to some protection.

Daniel M. Corssley, Mayfield

● *The law with regard to cats (Section 205) states that any licensed hunter over 21 years of age may kill a cat that is carrying or hunting some protected species of bird. The section on dogs (Section 195) states that any person may kill a dog pursuing deer in the Adirondack and Catskill parks at any time; elsewhere in the State, the owner is held liable if his dog is running at large on lands inhabited by deer, but such dogs may be killed only by Game Protectors, Forest Ranger or member of the State Police, and then only from Jan. 15 to April 15.*

It's our opinion that the laws relating to both cats and dogs running at large are inadequate, difficult of interpretation (who can tell if a cat is hunting a protected species), and badly in need of rewriting.—Editor

SCREAM IN THE NIGHT

Dear Editor: In the late hours of the evening one night last July, we were awakened by a most hideous scream which appeared to originate at the front of our summer camp cottage. I got out of bed to looksee and when the beam of my flashlight became focused at a point where a scuffling noise arose, there were two thieves attempting to remove the cover from our garbage can. The smaller of the two was trying his best to get the cover loose while the larger walked around in a circle with an air of disgust. Finally, after the latter's patience became too tried, he crept forward, rolled the can on its side, applied both hands to the cover and pulled the cover off. No sooner was this accomplished than the smaller of the two waltzed around into position and released a stream of "fire-water" which apparently covered the face and entered the eyes of the raccoon.

Needless to say, the little skunk began pawing over the contents of the can while the raccoon jumped into the air, rubbed his face into the gravel and made his retreat. If there is any doubt as to how loud a skunk can scream when given a cuff in the face by a raccoon—try to bring about a match between them.

David L. Wood, Syracuse

PORCUPINE CONTROL

Dear Sir: My father owns about 150 acres of reforested timberland near the Township of Cold Brook, N. Y. (Herkimer Co.) On a recent trip through this forest land (composed of red, white and Scotch pine) I noticed extensive damage and killing of trees due to porcupine girdling. Do you have any information on how we can rid the land of these pests without hurting the other animal populations which inhabit it?

Donald M. Fenner,
Colgate U, Hamilton

● *Mainly for the reasons you suggest, the porcupine is not protected in New York. Shooting them is probably the most effective control method, although often dens can be located (usually in rocky ground or ledges) and the animals can be trapped.—Editor*

SWAN NOTES

Dear Editor: Just in passing, you may be interested in knowing that the rare trumpeter swan uses the lake we live on (Lakelse Lake) in winter. When natural food is scarce, and grain is put out for the birds, they become sufficiently tame to allow these pictures to be snapped. The gray birds in the foreground are the one or two-year old cygnets, while the white birds are the parents.

Arthur Kramert,
Terrace, B. C., Canada

Gentlemen: This is for your rare and unusual. On the 16th of March there arrived a flock of whistling swans on the west branch of Lake Keuka. This morning, April 1, they took off for the north in "V" formation. They created lots of interest during their stay.

Allen S. McMinn, Branchport

Dear Sir: Recently I read in our local village weekly paper a short account of the flight of 30 or 40 whistling swans that were seen in the upper end of Swan Lake, near Liberty. I understand these swans breed from Hudson Bay to the Arctic and winter in considerable numbers on the inlets of Delaware and Chesapeake Bays. They fly very high and are seldom seen during migration. I was under the impression that whistling swans were quite rare now.

Esther Karst, Livingston Manor

● *Probably the best known annual visitors of this species appear on the Niagara River, but they are occasionally reported elsewhere in the State. Due mainly to protection, whistling swans appear to have been increasing considerably in recent years.—Editor*

BLACK PANTHER

Dear Sirs: It is very easy to sit at your desks in Albany and say there are not any Canadian lynx or panthers or black panthers in the State of New York. I for one say you are prevericators. A lady friend of mine and their neighbor has seen a black panther in back of their house in Wellsville. If I can get their permission I can give you their names so I know of at least one.

I can give you the names of a number of different people that either have heard the panther or seen it. In 1943 I lived in Snowball hollow just out of Scio. I had a two mile walk up a dirt road about half way home something spit just beside the road. About 20 feet stood the panther. He or she turned and ran up over the hill. On the same road going to work one afternoon I saw what I thought was a large cat after a neighbor cat. I walked within two feet of it and saw it wasn't. It crouched as if to spring, swung around, and up over a hill. When I looked it up in a wild animal book it was a Canadian lynx. Don't say it was a dog. Dogs don't spit.

We live on Wolf Spring Rd. now. I sat outdoors on a porch we haven't now and answered a panther for over an hour. Mr. Brown and I followed it a ways. He had a gun and I the flash light. The flash light nearly went out so we came home.

When my granddaughter was two months old, she is four now I left her bed in the kitchen. My room was a little ways from hers. During the night I heard cat claws in the wood. The next morning I went out and there were long scratches under my window where he tried to get in. Also tracks under it. It was a panther. As I understand it they follow the deer from Pennsylvania down through here to Rock City. We aren't bothered with them so close to the house as we have a neighbor now. Then we didn't. It wasn't anything to wake up in the morning and find tracks all around the house.

I would like whoever wrote that article in the Wellsville Reporter to be out here some dark nights alone with two small children and hear screams after scream going up over the hill. You would think some woman was being torn to pieces. I could sit here all night and write different things that I personally know about the panther. I am not afraid, only for the two babies. One is 4 months and the other 3.

I don't believe anyone will read this letter but you made me so darn angry.

Rose J. Brown, Scio

ROTENONE

Dear Sir: The article on the use of rotenone for killing undesirable fish ("Trout Restoration in the Adirondacks") is most informative. I miss one thing in it, and that is, some comment as to the fate of the dead fish. Do they float on top and look unlovely, or does the pond decently digest them?

Dr. Arthur Krida, New York City

● *Permits for the use of rotenone usually state that the fish killed should be buried. But in areas where aesthetic effect isn't a primary consideration, it's surprising how soon natural scavengers (including birds) will clean up the mess. Also, dead fish make dandy fertilizer.—Editor*

WOODCHUCK

Dear Editor: In the name of "conservation," let us do something about our woodchucks. I propose that "Marmata Monax" be removed from the "varmint" list and placed on the "game list." Our neighbor states of Pennsylvania and Ohio have done so. Why can't we? The usual reply is "too much opposition from the farmers." To answer that, I'll venture to say that in relation to total area, Ohio is more heavily farmed than New York.

A sharp decrease in the population is very evident. I definitely attribute this fact mostly to early (March) Spring 'chuck shooting before the animals have had a chance to breed. Other factors such as poison, gas bombs, super-accurate long-range varmint rifles and the increase of "varmint" hunters have also taken their heavy toll.

Furthermore, I believe the 'chuck (like the hawk) is credited with far more extensive damage than he actually does. Have you ever talked to one farmer who has actually lost stock as the result of their stepping in a 'chuck hole?

Sheldon Brown, Hamburg

WINTER ROBINS

Dear Sirs: My brother up in Essex has a farm of about 200 acres. His farm extends from Split Rock Mountain down to about 50 acres of swamp and trees. He tells me that about 500 robins wintered in that swampland. Is that a general procedure for robins?

John H. Dempster, Schenectady

● *We knew that robins sometimes winter in New York swamps, but we never heard of such a congregation.—Editor*

FUTURE RANGER

Dear Sirs: I would appreciate it if you would send me some information on forestry. This information may prove helpful to me, for some day when I grow up, I want to be a forest ranger. Right now I'm in the sixth grade at School 8. I hope to go to McKinley High School and take up forestry as a trade. Some people in my room say being a forest ranger is a lonely job, but I don't think I'd mind it. With nature how can you be lonely?

Edward W. Becker, Buffalo

● *We have printed forms describing this position and that of Game Protector, and we're sending them on. Also see articles in our last two issues. Good luck.—Editor*

STUMP REMOVAL

Dear Sir: This is something I saw happen in about 1915.

Mr. Wallace Babbitt, at least 85, had a huge old pine stump which was very unsightly, but his front porch had been built around it and he desired it removed. A lad I know did this in November. With a 2-inch auger he bored a deep hole in the center of the stump and filled the hole with one pint of turpentine and plugged the hole. Then he smeared 3 pounds of lard all over the stump's top. The following spring this lad returned in May and set the stump afire, and in a short time every inch of that stump—under ground and all—was completely gone.

The idea—when the sap went down it permeated every fiber of that stump with turp. Then when the sap arose in the spring it was ready to burn and destroy easily. That's as far as I know, but I presume any inflammable fluid would bring about the same result. But be sure to smear the tops of all stumps with lard to keep the moisture out throughout the winter.

Allen H. Davis, Albany

● *A word of caution: no matter how ignited, a stump may burn for many days before it's consumed. It's hard to keep an eye on a fire like that.—Editor*

ALBINO MUSKRAT

Dear Sir: I am enclosing a photograph showing one of our members (Warren Reynolds) with an albino muskrat which he caught in West Canada Creek, near Middleville, on March 22. While this specimen is considered rare, it is not as rare as the fact that the same boy took another albino 'rat the following day from the trap of Burr Dexter, former Game Protector, whom he was assisting in tending his traps. He also reports that several of his traps have been found, sprung, with white hairs on them since these two were taken. Perhaps these 'rats have found the secret of the snowshoe rabbit, in changing their coats with the season.

A. E. Howison, Corr. Sec.,
Ilion Fish & Game Club, Inc.

PRINTER'S INK

Dear Editor: Please! Be a nice guy and do one of the Charter Members of *The Conservationist's* subscription list a favor.

First, find out where your printer keeps his stock of printing ink. Then sneak down some dark night and confiscate his supply of that light-yellowish, bilious green ink which was used in some of the headlines, etc. in the last issue. Take it way out in the country to some isolated spot and after digging a deep hole, pour it in and carefully re-cover it, replacing each leaf and twig so it never can be found again.

C. Albert Jacob, Jr., Scarsdale

● *That was rough, wasn't it? But we doubt if you feel as bad about it as we do. By mistake, everything that was green in that issue should have been red, and vice versa. We'll try to see that it doesn't happen again.—Editor*

STRIPERS IN FRESH WATER

Dear Editor: Of great interest were your notes on striped bass in fresh waters. Here in the center of Nova Scotia and in Grand Lake (which is also grand by Nature) we have fine striped bass fishing. The lake is very clear and very deep—three miles wide and nine long. The fishing season opens April 16 and stripers are taken easily at this time. Baits? Well, fly line bait and also "tin-fish"; the pike minnow is fine bait.

I enclose a snap of some small but perfect bass. Note the fine full plump bodies and small heads. Many large bass live in this lake, also fresh water salmon and brook trout.

Gerald W. Horne,
Enfield, Nova Scotia

MORE ON FOX FIRE

Gentlemen: In offering corrections in your reply to Mrs. Dafoe in your Feb.-Mar. issue regarding the so-called "fox fire" phenomenon, Mr. Collins in the current April-May issue has himself made an obvious misstatement which should be corrected.

The gentleman writes: "It (methane) collects in pockets and when enough collects it bubbles to the surface of the marsh, or in this case the stream bank, *and ignites upon contact with the air.*"

As a matter of fact methane does not ignite upon contact with the air except when subjected to a very high temperature. Atmospheric temperatures in nature are never sufficiently high to ignite methane. The flame of a match or a hot spark are necessary to raise it to its kindling point.

If Mr. Collins will reflect a moment he'll recall that the municipal gas supply of his home city is 80% or more methane, natural gas, piped there from Pennsylvania. If methane ignited merely from contact with the air Syracuse householders would never need to light their gas burners with matches or keep a pilot flame going in their gas stoves. Moreover, since the dreaded "fire damp" of coal mines is methane, there would be no occasion for the use of Davey safety lamps or other safety measures to prevent the ignition of "fire damp" in mines if it ignited on contact with the air. The gas would burn off as fast as it escaped from the walls of the mine. As it is, however, the gas does not ignite and collects in the mine. If an open flame or spark then comes in contact with the gas it burns; if mixed with proper proportions of air the combustion is so rapid that it constitutes an explosion.

As for the real cause of the "fox fire" observed by Mrs. Dafoe, it is difficult to explain if she really saw "blue and yellow flames flickering."

The typical luminescence seen in decaying wood is merely a rather faint glow—so-called phosphorescence—and is usually due to the action of certain bacteria. This is also the cause of the "phosphorescence" of the sea in northern latitudes. These bacteria are known as "photogenic" (not to be confused with the photogenic ladies of Hollywood.) Photogenesis is by no means confined to bacteria but is found in many other types of organisms, particularly insects and fish. In fact this ability to produce light is well nigh universal in fish living in the abysmal depths of the high seas.

Mrs. Dafoe's suggestion that the term "fox fire" resulted from the corruption of the French word "faux" is ingenious but incorrect. The term is actually derived from the intransitive verb "fox" which means to "become discolored; particularly to turn reddish: said of timber, paper, leather, etc. to become sour: said of beer and the like." In other words, to undergo partial decomposition or decay—hence "fox fire," the fire of decomposition.

Henry N. Jones,
Cloyne, Ontario, Canada

DEATH IN THE CHIMNEY

Dear Editor: I served as Fire Warden for a while and am now serving as Special Game Protector here in Columbia Co., so my mind is usually not far from matters pertaining to fire prevention, conservation, etc. When I noticed the fire screen on my fireplace chimney starting to rust and fall apart, I knew that it would need replacement, as our home is quite near open fields and wooded hills.

I removed the defective screen and decided to clean the chimney before replacing with new. During the few days it was off, we heard rustling in the fireplace and chimney. Thinking some squirrel had fallen in, I lowered a heavy manila rope and let it hang overnight, hoping our visitor could climb up the rope more easily than he could up the chimney.

Well the rustling stopped, and today was cleanout day. Were we surprised! We found a wood duck (sorry, she was dead) had built her nest complete with egg on the ledge just above the damper. Our chimney undoubtedly had all the appeal of a hollow tree, complete with solid rock protection.

Let's all get our chimneys covered with screening to keep the woods safe from sparks and wood ducks, etc., free from such traps.

Jim Dennison, Copake

FOR THE ARMED FORCES

Dear Editor: During my visits through southern Japan I find that the crows here are much larger than any of the crows that I have ever seen in the states. The wing span in my estimation is a minimum of two and one half feet. When standing I would say they are approximately ten or eleven inches.

My father sends me the magazine every two months, but since we are about ready to go to Korea I don't imagine I'll see your next copy.

Pfc. Robert Whalen,
c/o P.M., San Francisco, Calif.

Dear Sirs: I can't tell you how surprised I was to find an edition (August-September 1950) of *The Conservationist* here so many thousands of miles from home. Your circulation could not reach much farther, for this issue was received in the Red Cross section of this Air Force hospital from a Korean veteran who wisely left it for someone else to enjoy.

Sgt. Chas. H. Philo,
c/o P.M., San Francisco, Calif.

Dear Editor: Just received my copy of *The Conservationist* for December-January. It is very good reading. The other fellows in my tent enjoy it also and you may be getting other subscribers from Okinawa soon.

S/Sgt. Lloyd Stott,
c/o P.M., San Francisco, Calif.

Gentlemen: We are planning to send gift subscriptions to *The Conservationist* to all our members who are in the service, and I am enclosing the first two of these. As soon as we can obtain addresses I will send you additional subscriptions.

Knowing how much we at home enjoy reading *The Conservationist*, we know that it will bring a lot of pleasure to these boys and their buddies. We may not be the first with this idea, but hope that some of the other clubs will pick it up, and not only boost the magazine, but also help the boys in the service to keep in touch with their fellow sportsmen at home.

A. E. Howison, Corr. Sec.,
Ilion Fish & Game Club, Inc.

FROG CONTROL

Gentlemen: I would like to know if you have any chemical or dilute which, if put in water, would evacuate the frogs in a pool which I have in my backyard. Since the summer is coming on I would like to use the pool for the purpose of swimming. If possible I would like the fish to remain in the pool, but I want to evacuate the frogs.

Frank Simon, East Chatham

● *We don't know of any such chemical. The best control measure would probably be to eradicate shore and pond plants, because frogs usually won't stay around without such cover. An appetite for frogs' legs is also effective.—Editor*

DEER SEASONS

Dear Sir: In your February-March issue under Deer Take you have six days for Central and Western counties. That is correct. But for the Catskill region you have 15 days, which should be 16 days; and for the Adirondack region 30 days, which should be 32. If you had been correct, it would have made the Central and Western counties look still better.

Walter S. Fox, Nelliston

● *You're right.—Editor*

BOBCAT

Gentlemen: I can't help taking a few minutes away from more pressing matters to send along the enclosed snapshot of what must be an ordinary bobcat track with a silver dollar alongside for scale. As an active vacationer, fisher, and hunter in the Adirondacks I have followed the "panther" stories with interest. I only send this little picture along to emphasize that an ordinary bobcat print is pretty big. I have measured lynx tracks in Quebec that would go another inch both ways. I don't have any dope on "panther" tracks but I have seen lion tracks in Colorado which I would judge from memory (and zoo observation) would be about the same as lynx. Everyone knows the lynx has out-size snow-shoe pads.

The other interesting fact about the enclosed print is that the shot was made in Essex County in the fall of 1947, when the water was low on the edge of this particular pond. (Clear Pond near Elk Lake, where native salmon still hang on).

The job your Department and your magazine are doing seems outstanding to me. Many thanks from a "foreigner"!

Gilbert G. Emerson,
Upper Montclair, New Jersey

WHAT IS IT?

Dear Sir: I am inclosing snapshots of some animal tracks in the snow made around my house the night of March 2, '51, between 11:45 P.M. and 8 A.M. These prints were at least 3½ inches square and the claws were at least 2" to 2½" long on all four feet as the prints show. Each pair of prints were 2½ feet apart, with five toes.

You had some pictures of different animal tracks in the Feb.-Mar. 1951 *Conservationist*, but there were no tracks to match the ones in my snapshots. I am quite anxious to find out what animal made these tracks so close to my house.

William McCulley, Oneida

● *We'd say your visitor was a dog. The track pattern is characteristic of a dog trotting along, and we feel you must have made a mistake about the number of toes; no animal with tracks this large has five toes except a bear, and those aren't bear tracks. And a bobcat is ruled out because normally cat claws don't show.—Nick Drahos.*

DONALDSON'S HISTORY

Dear Sir: I have the two volumes of "A History of the Adirondacks," by Alfred L. Donaldson. They are personally autographed by Alfred L. Donaldson and his wife, to whom the volumes were dedicated. Both volumes are in rough cut pages and bound in green fibre covers, published by the Century Co. of New York City. The two volumes I have are for sale to whoever is interested in same.

Dudley D. Humphrey,
847 Thompson St., Schenectady

DELAWARE TROUT

Dear Editor: It may interest you to know that for the past six years I have taken good trout out of the Delaware River between Hankins and Long Eddy. Last year I took 22 rainbow trout there and 9 browns, fishing in the early evening with wet flies and with spinners and spoons. The rainbows ran from 12" to 20" and the browns from 16" to 24". I have also seen numbers of these beautiful trout speared in this locality by natives spearing for eels. I have never caught or raised any small trout there. All of the trout were fat and heavy and only seemed to feed on a rising stream after a rain in the daytime, or between ten and twelve at night after the water had cooled and the large night insects had become plentiful. The dry fly is no good at all here for trout.

Since I only keep enough trout to eat, I put most of these fish back and may have caught some of the same fish over again on other days. I noticed that the water where these fish are is considerably cooler than the rest of the river, dropping down to as low as 64 degrees by ten o'clock at night, in some of the eddies, in others to 68 and 70 degrees in midsummer.

Winfield Davis, Newark, New Jersey

SMOKING RANGER

Gentlemen: On page 35 of April-May issue of *The Conservationist* it says Bureau of Forest Fire Control, and then the title of the picture "Forest Ranger," and then the picture. Could that be smoke curling up from a cigarette in his left hand?

Charles H. Farley, Oswego

● *That's right. Lots of Rangers smoke—but carefully.—Editor*

CREDITS

First cover, pages 2, 3, Erik Hans Krause; second cover, 5, 9, Doug Finch; 6, John R. Greeley; 8, Gerald J. Rider; 11, Wilson F. Clark; 14, 15, N. Y. S. Museum, N. Y. S. College of Forestry, U. S. Dept. of Agri., Ohio State U.; 17, Robert F. Perry; 18, 19, Ellen Edmonson; 20, 21, 22, Doug Finch, Earl J. McGuirk, James Skinner; 23, U. B. Stone; 24, 25, Nick Drahos; 26, 27, Robert A. Reed; 28, 29, Fred Everett; 31, J. D. Bulger, D. H. Martin; 32, B. Melville Nicholas; 33, Fred Chambers.

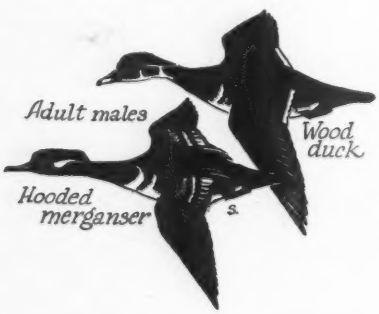
Duck with a Helmet

MORE people seem to be more intensely interested in wild ducks than in any other group of birds. Twenty-five kinds of these oiled-feather web-foots are likely to be encountered somewhere in New York during migrations. Most kinds have nested with us at one time or other. But only four think enough of what we have to offer to stick around in the spring consistently and play house. New Yorkers, therefore, should be particularly interested in this resident quartet.

One of the four is the mallard. But his domestic leanings have been bent strongly by the Conservation Department which for years has been liberating increasing numbers of loving couples and impressionable adolescents from the game farms. Number two is the black duck, king of the tribe—and may it increase. Number three is the wood duck, one of the most colorful of all American birds. The fourth is the wood duck's rival—the hooded merganser, a duck of great personal charm, great speed, great beauty and concerning which we *don't* know a great deal.

Our subject is one of the three mergansers. Most hunters fail to distinguish one from the other, lumping all under the same name—saw bill or fish duck—and damning the whole kaboodle because they eat fish, smell fishy and taste like fish instead of duck.

The hooded merganser deserves a better break. He'd get it if he had a better beak—a normal flat one instead of a roundish, saw-toothed spike. Not only is he by far the smallest of the mergansers but his average heft of a bit over one pound puts him in the waterfowl flyweight class.



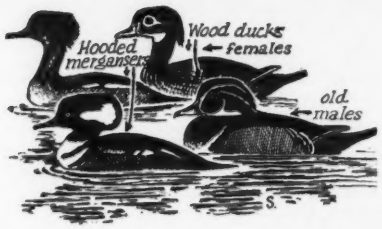
Its home is quiet wild ponds—beaver ponds, and slow wooded streams—brown streams that have come through hemlock or spruce or cedar. Like the wood duck it prefers to nest in a hole in a tree, only a wilder tree. Its eggs look like white billiard balls that would roll cock-eyed and they're pretty darned near as hard. Their Ma has to sit on them over a month to get a down payment.

For many years we have been trying to catch a baby hooded merganser. All told, maybe 150 of these fuzzy water crickets, some only a few hours old, have been chased by us. We have chased them with bare hands, fish nets, minnow seines, canoe paddles, oars and trout rods. We have surrounded them in tiny brooks and in little ponds scalloped with bare, sandy beaches. We know Ma Merganser's lame duck bag of tricks and we know just what the little guys probably will do. But we never have come really close to catching a baby hooded merganser although many undoubtedly have been scared out of their little white duck pants. They're equally agile on the water or under the water.

No duck has any better command of his wings than the hooded merganser. He can leap straight up from the water like a black duck and rocket away through the trees more swiftly than a wood duck. The other two mergansers normally must paddle along the surface like the others divers before lifting themselves in low flight. The hooded's wings, moving as fast as a teal's, never whistle. Their rustle is as soft as a zephyr in the aspen leaves. They usually fly in singles or pairs (never in a large flock) and they keep close together, darting in and out like green-wing teal or splitting across an old beaver meadow like streamlined arrows, bills and necks straight out and the white bands across their secondary wing feathers a blurred flicker.

The great white, black-edged crest of the mature male hooded merganser can be raised and lowered in an instant. The little black knight of the waters who owns this striking helmet makes the most of it. He swims along, tail characteristically flat on the water, raising and lowering his crest just to make his reflection happy. From away off the action catches the eye like the intermittant flashing of a heliograph.

The males of most ducks are dressed like they look in the pictures by late autumn of their first year. Some, like the wood duck, don't attain full plumage until the second season. But the hooded merganser's ultimate glory



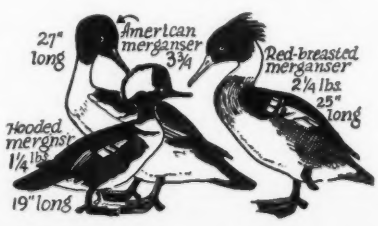
isn't gained until the third. Only rarely is a full-plumaged male killed.

Most of the hunter's total autumn bag of ducks is made up of young birds hatched that spring. A few are in their second season. Comparatively rare is a three-year-old. The average life expectancy of the whole duck clan in the wild today probably is not more than four years, like the brook trout among game fish. So the helmeted one has a couple of strikes against him before he even comes to bat with his Sunday suit on. This is just a guess because very few hooded mergansers ever have been banded. Most ducks can be expected to live a dozen years or more if they can stay on a clear track.

Female hooded mergansers, which are very difficult to distinguish from young males, bear a straggly rich brown crest. This plus the wide white band on the wings separates them from the wood ducks with which they often associate. The greatest difference is in the voice. The wood duck says *who-eek, who-eek.* But when the almost equally beautiful hooded merganser opens his trap—what comes out but a completely disillusioning croak. And it isn't a very high class croak at that.

SO there you have a few notes on a spectacular resident we should know better. To be sure he's a fish eater like the other two mergansers which occasionally *do* knock off some of our trout. But he shares crayfish with the otter, frogs with the 'coons, aquatic insects with the fish, seeds and sedges with the other ducks. Most of all he provides the kind of startling beauty we always hope to find when we stealthily part the curtains to peer into wild places.

—CLAYT SEAGEARS



By Clayt Seagears

DUCK WITH A HELMET

HOODED MERGANSER

MOUNTAIN LAUREL;
CALICO BUSH
Kalmia latifolia

PALE OR SWAMP
LAUREL
Kalmia polifolia

Courtesy
N. Y. State Museum